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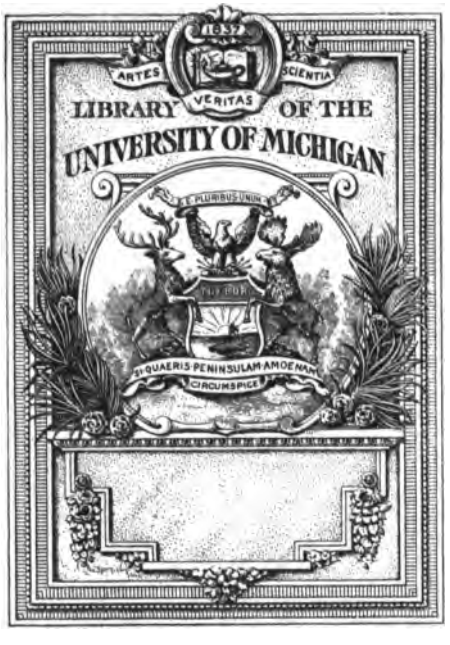
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Yrs. truly

TRANSACTIONS

OF THE

FORTY-FOURTH ANNUAL MEETING

OF THE

OHIO STATE MEDICAL SOCIETY,

HELD AT

YOUNGSTOWN,

MAY 22, 23 AND 24, 1889.

CLEVELAND, OHIO:
THE WILLIAMS PUBLISHING COMPANY,
1889.

Yrs. truly

P. L. Carrol

[illegible]

[illegible]

[illegible]

[illegible] MEDICAL SOCIETY

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CLEVELAND, OHIO:
THE WILLIAMS PUBLISHING COMPANY,
1880.

OFFICERS FOR 1889-90.

J. McCURDY, M. D., Youngstown.....PRESIDENT
W. J. CONKLIN, M. D., Dayton..... VICE-PRESIDENT
A. W. RIDENOUR, M. D., Massillon.....VICE-PRESIDENT
C. W. TANGEMAN, M. D., Cincinnati.....VICE-PRESIDENT
J. E. WOODBRIDGE, M. D., Youngstown.....VICE-PRESIDENT
G. A. COLLAMORE, M. D., Toledo.....SECRETARY
E. C. BRUSH, M. D., Zanesville.....ASSISTANT SECRETARY
T. W. JONES, M. D., Columbus.....TREASURER AND LIBRARIAN

STANDING COMMITTEES.

FINANCE.

W. S. HOUGH, M. D., D. P. ALLEN, M. D., W. T. CORLETT, M. D.,
E. W. HOWARD, M. D., S. S. THORN, M. D.

ETHICS.

H. S. UPSON, M. D., W. J. SCOTT, M. D., C. L. VAN PELT. M. D.,
F. C. LARIMORE, M. D., DAN MILLIKIN, M. D.

PUBLICATION.

J. F. BALDWIN, M. D., A. B. CARPENTER, M. D., J. RANSOHOFF, M. D.,
A. R. BAKER, M. D., W. H. H. NASH, M. D.,
and J. McCURDY, M. D., G. A. COLLAMORE, M. D., *ex-officio.*

LEGISLATION.

S. LOVING, M. D., D. N. KINSMAN, M. D., D. C. WILSON, M. D.,
F. D. BAIN, M. D., H. J. DONAHOE, M. D.

ADMISSIONS.

D. J. MERRIMAN, M. D., C. P. LANDON, M. D., H. M. BROWN, M. D.,
A. W. RIDENOUR, M. D., P. P. POMERENE, M. D.

FORTY-FOURTH ANNUAL MEETING

OF THE

OHIO STATE MEDICAL SOCIETY,

HELD AT YOUNGSTOWN, MAY 22, 23, 24, 1889.

The Society met in Wick Hall, and was called to order at two o'clock P. M., May 22, by the President, Dr. P. S. Conner.

Prayer was offered by the Rev. A. N. Craft.

Dr. John McCurdy, Chairman of the Committee of Arrangements, made the following report, which was adopted:

Mr. President and Gentlemen of the Ohio State Medical Society:

Your professional brethren and our citizens extend to you a most cordial welcome. It is the first time in the forty years' history of our Society that you have visited our little city, and we fully appreciate your kindly spirit in coming so far north and so near the border of our state to hold your yearly convention.

There is no part of our great and loyal state that is not represented here to-day, and it is the desire of our people that you accept our hospitalities in the spirit in which they are given, and that you take home with you memories of a pleasant and profitable visit. Many of you thought a year ago that our invitation to meet with us

was decidedly florid, with a tinge of presumption, for by so doing you were taken from cities and beautiful towns of the central part of our state, whose geographical position entitled them to your choice; but, being proud of our valley and town, we invited you with confidence and without a tremor of bashfulness. That you may know we have cause for our local pride, I will give you some data which were furnished me by the courtesy of Mr. J. H. Sheadle, secretary of the Mahoning Valley Iron Manufacturers' Association. These data cover about eight months of the last year.

The time our various plants were in active operation our mills furnished 608,269 tons of freight; our furnaces, 1,489,386, of which 503,178 were outbound and 1,594,477 tons incoming freight. For this same period were paid to the railroad lines for moving said tonnage nearly two and three-quarter million dollars. These roads for said sum moved in and out of our little valley 327,937,536 tons, one mile taking which required 16,511,545 cars carrying 20 tons each, which, if placed in line, would belt the earth three times. This is equal to 62 per cent. of the railroad tonnage of the great state of Texas, and equal to that of Arkansas, Oregon, West Virginia, New Hampshire and Delaware.

Our modesty will not allow us to stop here. Although nearly midway between Cleveland and Pittsburgh, we can show in our mercantile enterprise many establishments ranking full abreast of either of our flanking cities, and one with a single floor, and its numerous departments greater in extent than to be found in either of the cities named.

Our milling capacity enables us to produce 500 barrels of flour daily. Our tube works, foundries, machine and boiler shops send their productions from Maine to California, and from the lakes to the gulf.

There is no form of fuel that has established its advantages that is not used here, and we are fully supplied by pipe lines with natural gas, brought more than fifty miles.

The old Ohio & Pennsylvania canal passed through this place, made memorable by being for many years the only means of transporting the famous Brier Hill coal of our famous war governer, Tod, and also by being the commercial highway on which our great statesman and President, Garfield, once drove a canal horse. This is now superseded by the great trunk lines of the Pennsylvania Company, Pittsburgh & Lake Erie, Lake Shore, Erie, and Pittsburgh & Western, besides numerous branches of equal gauge, connecting the mineral deposits of this vicinity with the manufactories.

It is the wish of our people that you visit any or all points of interest to you, and by intimating your wish to your presiding officer, carriages will be ready to carry any or all of you to the places of your choice.

The Committee on Finance was filled by the appointment of Drs. J. Harmon, F. C. Larimore and R. B. Hall, *vice* W. T. Corlett, S. S. Thorn and H. J. Sharp, *absent.*

The Committee on Admissions was filled by the appointment of Drs. T. McEbright, R. A. Vance, Eli Conn, G. H. Colvill and G. Goodhue.

The Secretary submitted the following report:

At my last report there were 527 members belonging to the Society. At the last meeting 33 new members were admitted, and up to publication of the 'Transactions' 44 had been dropped for non-payment of dues, leaving on the present list 516 active members, a net loss of 11.

The deaths reported during the year are those of J. D. Daugherty of Dayton; L. Firestone of Wooster; D.

Halderman of Columbus; J. C. Thompson of South Bloomfield; Joseph Turney of Nevada; J. W. Underhill and E. Williams of Cincinnati; R. C. Russ of Hillsboro, and John A. Dickey of Goshen.

Obituary notices of Drs. Williams, Daugherty and Turney have been received.

There has been an increased mortality among Auxiliary Societies, the following having deceased: Academy of Medicine of Delaware County, aged two years; Athens County Medical Society, aged twenty-three years; Defiance County Medical Society, eight years; Knox County Medical Society, twenty-six years; Morrow County Medical Society, eleven years, and Stark County Medical Society, thirty-seven years.

General apathy is credited with the larger share of these misfortunes, though, in a few cases, they are due to a want of harmony in the local profession.

Reports have been received from all Auxiliary Societies except Lake County and Monroe County.

The following bills have been countersigned:

Printing 'Transactions' for 1888, approved by Committee on Publication	$371 70
Expenses of Secretary as per statement	46 73

The expenses for the Secretary's office for the past year have been as follows:

Postage Stamps, Postal-Cards and Postal Envelopes	$17 29
Printing and Folding	10 25
Stationery	30
	$27 84

The following titles of papers have been received since the publication of the programme: "Gonorrhœal Cystitis," [illegible] F. Lee, Columbus; "Trephining on Account of

Injuries to the Head," by Dudley P. Allen of Cleveland, and "Palatable Medication," by A. M. Duncan of Bucyrus.

Respectfully submitted,

G. A. COLLAMORE,
Secretary.

On motion, that portion of the report which refers to defunct Auxiliary Societies was referred to the Committee on Admissions.

The Treasurer and Librarian presented the following report:

MAY 22, 1889.

To the Ohio State Medical Society:

I respectfully report as Treasurer the following:

My last report at Columbus, June 13, 1888,

Showed a delinquency of	$ 69 56
SINCE THAT DATE EXPENDED:	
Treasurer and Librarian	$ 75 00
E. C. Brush	5 00
G. A. Collamore	46 73
Gazette Printing House	5 50
Envelopes and Stamps	4 00
Opha Moore	39 50
Williams Publishing Company	371 70
Cleveland Medical Gazette	30 74
Gazette Printing House	6 50
Central Ohio Paper Company	1 80
Stamps, Postal-Cards	6 00
Freight and Drayage on 'Transactions' from Cleveland	2 50
H. J. Sharp, for State Board Examiners' Bill	13 00
Express Offices, as Receipt Books herewith show	11 85
Postage Stamps	1 50
	$621 32
	$690 88

Received as Initiation Fees and Dues.....	$565 00	
Received for three Copies 'Transactions'...	3 00	
	$568 00	
		$122 88
		6 00
Leaving a deficiency of receipts over expenses of..		$116 88

Referred to Committee on Finance.

The Committee on Publication reported as follows:

YOUNGSTOWN, OHIO, May 22, 1889.

Your committee met in Columbus June 15, 1888, and appointed a sub-committee, consisting of Drs. A. R. Baker and A. B. Carpenter, to edit and publish the 'Transactions.'

Bids were asked for from all the leading publishing houses in Cleveland for printing five hundred copies of the 'Transactions' of the Ohio State Medical Society, like sample of 1887, with fifty reprints of each article. Bids were received as follows:

The Williams Publishing Company.....	$300 00
The Evangelical Publishing House.....	436 50
The Cleveland Leader (Reprints extra).....	350 00
The Cleveland Printing & Publishing Company.....	349 00
The bid of the Williams Publishing Company being lower than that of any others was accepted.....	300 00
150 copies extra were ordered at 35 cents per copy....	52 50
8 pages extra, at 85 cents per page.....	6 80
Time work for author's changes at 60 cents per hour...	12 40
Total of Printer's Bill.....	$371 70
Express charges paid American Express Company.....	$ 24 70
Mailing 30 copies of 'Transactions,' Wrapping Paper, Directing and Wrapping, Twine, Box and Boxing,	

Postage and other incidentals	$ 6 04
Total	$402 44
Received from Treasurer	402 44
Reprints not paid for	4 50

Your committee regret that the stenographer's report of the discussions proved entirely useless. An effort was made to have some of the gentlemen write out their remarks for publication, but this was soon found impracticable.

Proofs of all papers were submitted to the authors for revision, which delayed the appearance of the 'Transactions' somewhat, and added a trifling amount to the cost for time work in making author's changes.

The report was discussed by Dr. A. B. Carpenter, who represented that certain reprints of papers published in the 'Transactions,' which had been ordered by the authors, had not been paid for by these authors, and moved that the deficiency—amounting to $4.50—be paid by the Society to Dr. A. R. Baker, who had furnished the reprints.

After discussion by Drs. R. A. Vance, A. R. Baker, E. Conn and J. McCurdy, the motion was carried, and Dr. Baker was requested to place the accounts in the hands of the Treasurer for presentation.

The Committee on "Act Providing for the Protection of Physicians, etc," by Dr. P. S. Conner, Chairman, reported progress and requested further time, which was granted.

A communication from Dr. Albert L. Gihon, Chairman Rush Monument Committee, with reference to subscriptions to the Rush Monument Fund, was read by the Secretary: action deferred.

The Committee on Finance presented the following report:

Finance Committee report Treasurer's cash receipts correct. Vouchers correct.

Recommend an assessment of two dollars ($2).

Recommend that the Treasurer be instructed, in case of members largely in arrears for annual dues, to arrange for their reëstablishment to membership in the Society by payment of an equitable proportion of their dues.

Respectfully submitted,

DUDLEY P. ALLEN, *Chairman.*

Dr. E. S. McKee of Cincinnati, delegate to the Indiana and Kentucky State Medical Societies, presented the following report, which was read by the Secretary:

Mr. President and Gentlemen of the Ohio State Medical Society:

Having been elected as delegate from the Ohio State Medical Society to the State Societies of Indiana and Kentucky, I beg leave to report upon these respective meetings.

The Indiana State Medical Society met in its fortieth annual session at Indianapolis, May 1 and 2, 1889. There was a good attendance; the papers read were of high order and well discussed. This organization meets every year in Indianapolis, which to Indiana is a very central and accessible city. It is a great advantage in many respects to have a permanent and convenient place of meeting. If we had in Ohio so central a city as Indianapolis is to Indiana, I would favor a similar custom here. The one great feature of the Indiana State Medical Society, however, is the thoroughness of its organization. Eighty out of the one hundred counties of the state have county medical societies. Every county society is auxiliary to

the State Society. All members of the county organization are members of the state organization by virtue of their membership in the former; moreover, they cannot become members of the State Society unless they belong to their respective county associations. The Hoosier doctor on his native heath is, as elsewhere, very agreeable, and the social feature of the meeting was not neglected. It seemed indeed a reunion of friends tried and true. Your delegate was so kindly received that he feels himself and the Society he represents highly honored.

The Kentucky State Medical Society held its thirty-fourth annual meeting at Richmond, May 8, 9 and 10, 1889. This Society is always remarkable for the richness of its programme. First, they have reports on all imaginable special departments in medicine, about fifteen altogether; two gentlemen being appointed to discuss each report. The programme also had many papers on miscellaneous subjects, each paper having two gentlemen named to discuss it. The programme was so full that two evening sessions were required, in addition to the day sessions, for its completion.

The meeting this year was a very harmonious one, and the Society is to be congratulated on its safe passage through troubled waters which threatened a bitter schism at the meeting of last year at Crab Orchard. Kentucky hospitality is proverbial, but no one can fully appreciate the term until he has experienced its reality. The good people of Richmond did their utmost to render the meeting in their midst a memorable one, in their efforts for our enjoyment. The Ohio State Medical Society was again honored by the many kindnesses showered upon its representative.

We may learn from the Indiana State Society the effectiveness of a body thoroughly organized, and from the

Kentucky Medical Society how to compile an excellent programme. From both, we, as a State Medical Society, might learn to be more social and to closer bind the ties of friendship within our borders.

I am of the opinion, that the sending delegates to the societies of our neighboring states will lead to a more kindly feeling between them and us, and we may gain the knowledge from our neighbors how to improve our own Society and to avoid some things which had better be left undone.

Respectfully yours,

E. S. McKee, M. D.

Cincinnati, May 20, 1889.

A paper was read by Dr. A. R. Baker of Cleveland on "A Few Observations on the Etiology, Prognosis and Cure of Incipient Cataract, without Operative Interference."

Discussed by Dr. J. Bennitt, Cleveland.

A paper on "Ankle Injuries," by Dr. J. T. Woods of Toledo, was read by the Secretary.

On motion of Dr. F. D. Case it was voted that papers by authors who were present be given the preference in reading.

A paper was read by Dr. R. A. Vance of Cleveland on "Intestino-Vaginal Fistulæ."

A paper was read by Dr. G. Goodhue of Dayton on "Trephining."

Discussion deferred.

The President announced as the Committee on Nominations, Drs. R. B. Hall, J. Bennitt, E. Conn, F. C. Larimore and G. Goodhue.

Dr. R. B. Hall moved that when the Society adjourned it should adjourn to 7:30 P. M.

After discussion by Drs. J. McCurdy and R. A. Vance, the motion was carried.

A case of tubercular peritonitis, cured by abdominal section, was reported by Dr. D. P. Allen of Cleveland and the patient exhibited.

Adjourned.

WEDNESDAY—EVENING SESSION.

Society was called to order at 7:30 P. M., President Conner in the chair.

The minutes of the preceding session were read and approved.

A paper was read by Dr. E. Conn of Akron on "Disturbed Equilibrium as a Factor in Health and Disease."

A paper was read by Dr. J. McCurdy of Youngstown on "Pressure as a Remedial Agent."

Discussed by Drs. Vance and Herrick of Cleveland and T. C. Miller of Massillon.

A paper was read by Dr. J. E. Woodbridge of Youngstown on "Climatic Treatment of Consumption."

Discussed by Drs. McCurdy, Herrick, and F. D. Case of Ashtabula.

On motion of Dr. Woodbridge, it was voted that a committee of three be appointed to consider the subject of consumption and report at the next meeting.

The President appointed as this committee Drs. J. E. Woodbridge of Youngstown, H. J. Herrick of Cleveland and F. D. Case of Ashtabula.

On motion of Dr. D. P. Allen, Dr. J. T. Whittaker of Cincinnati, and on motion of Dr. Herrick, Dr. D. N. Kinsman of Columbus were added to the committee.

The Secretary read the following dispatch from the Hon. R. Montgomery, Mayor of Youngstown:

TOLEDO, O., May 22, 1889.

To Dr. John McCurdy:

Present to the visitors of your fraternity my sincere re-

grets at not being able to be with you and extend to them a most hearty welcome and the freedom of the city.

R. MONTGOMERY.

A paper on "Personal Reminiscences on the Subject of Anesthesia," by Dr. H. Culbertson of Zanesville, was read by Dr. P. S. Conner.

Discussed by Drs. D. P. Allen, R. A. Vance and X. C. Scott of Cleveland, P. S. Conner and R. B. Hall of Cincinnati.

Society adjourned to 9 A. M., May 23.

SECOND DAY—MORNING SESSION.

The Society was called to order at 9 A. M., by President Conner.

The minutes of the last session were read and approved.

Dr. T. A. Reamy proposed the following amendment to the Constitution: In Article III, Section 5, insert after the words "shall be members of a county or district society where they reside," the following, "except that applicants from counties where there is no local society may be admitted without this requirement."

Dr. W. S. Battles, Shreve, Ohio:—It would be well before passing the motion to assign the reasons for adopting the resolution that members of the Society had who have been members for thirty years. You will recollect when the Society was organized, we belonged to no local societies. Xenia would come pitted against Cincinnati, and Cleveland against Sandusky, and Columbus against Toledo. They would have some grievances against each other. This was quite common all over the state. There was another difficulty. A man would become dissatisfied with another society, and get out a character certificate from one who belonged in the county, but did not com-

municate with the society, would go out and demand membership in the state society, and by that means a good many persons who were unworthy, who did not have any standing in the county where they were, would climb into our Society, and soon we would have to drop them, and pass upon these ethical questions, and so it was that we passed a resolution a few years ago, asking every county in the state to form a local society. It was supposed the members of the local society would know the status of the man there, and it would have the effect of taking the ethics questions back to the local society where they belonged, and not take so much of the valuable time of this Society, and thereupon this rule was made. And I understand the gentleman to say there was a provision by which at any time the member from the county that had no local organization might, by a two-thirds vote, be introduced into this Society. Well, I am not in favor of the motion in this case as read touching the resolution. At the same time we had better be very careful how we adopt this rule, for it has done more to save all of these organizations than anything else that has been indicated.

Dr. Scott:—These gentlemen that come here from counties which have no society are compelled to be recommended by two members of this Society, and I am quite willing to see them come. I hope to see the amendment carried.

Dr. R. A. Vance, Cleveland, Ohio:—I had a case yesterday. I will recite it. It seems that down in the town of Mt. Vernon, where our friend Larimore lives, a couple of physicians came from another state, and they were graduates of Michigan University, and they are members of the Michigan State Society. In Knox county there is no medical society. The committee, after farther investigation, recommended both; one was elected, and somebody brought up this clause of the constitution

and the other was not elected. Now, then, if this amendment prevails, it will enable us to rectify this injustice, and also to enable the committee to pass upon a number of other recommends in their hands, and it will tend to make the local societies of the state a power in the land.

Dr. J. Bennitt, Cleveland, Ohio :—Well, I am in favor of the spirit of this amendment. But it occurs to me that you are just undoing, by the adoption of it, that which you sought to do when the last amendment to the constitution was adopted, that is, to discourage, or rather fail to encourage, the organizations of county medical societies. If there is a county in which there is no medical society, the medical gentlemen so situated can take the proposition to the state society, without the necessity of having a local society, and they will not be so earnest in their endeavors to form local societies. I mention this as a point not vital against the proposition, but still one that has some bearing on it.

Amendment adopted.

A paper was read by Dr. C. W. Tangeman of Cincinnati on "The Use of Jequirity in Diseases of the Eye."

Discussed by Drs. X. C. Scott and A. R. Baker.

A paper was read by Dr. H. J. Herrick of Cleveland on "The Modern Theories of Tubercle and the Therapeutical Tests."

Discussed by Drs. J. Bennitt, G. H. Colvill of Harrisville, and A. R. Smart of Toledo.

A paper was read by Dr. D. P. Allen of Cleveland on "Treatment of Injuries to the Head," and a patient exhibited on whom the operation of trephining for injury had been performed.

This paper and that of Dr. Goodhue were discussed by Drs. Vance, Herrick, Tangeman, McCurdy, Bennitt, A. W. Ridenour of Massillon, S. S. Thorn of Toledo, S. Lov-

ing of Columbus, H. M. Fisher and E. Conn of Akron, and F. D. Case of Ashtabula.

The Secretary read the following communication:

DETROIT, MICHIGAN, May 20, 1889.

G. A. Collamore, M.D., Sec'y O. S. M. Society:

MY DEAR SIR:—Allow me to thank you for your very kind invitation to attend the annual meeting of the Ohio State Medical Society, of which I have the honor to be an honorary member. I regret very much my inability to be with you on this pleasant and, I am sure, profitable occasion.

Permit me to send greeting. My kindest regards and best wishes to the members of the Society, and believe me, Yours respectfully,

WM. BRODIE.

Society adjourned to 2 P. M.

SECOND DAY—AFTERNOON SESSION.

Society met at 2 P. M., President Conner in the chair.

Minutes of previous session were read and approved.

Dr. E. H. Hyatt, chairman of Committee on "Immigration of Defective Classes," made a verbal report, and the committee was ordered to be continued.

The President then delivered the Annual Address.

Dr. R. A. Vance offered the following resolution, which was adopted:

Resolved, That the portion of the President's address referring to the organization of county societies and their relation to the State Medical Society be referred to a special committee of seven, consisting of Drs. T. A. Reamy of Cincinnati, S. S. Thorn of Toledo, Starling Loving of Columbus, T. McEbright of Akron, A. R. Baker of Cleveland, G. Goodhue of Dayton, and F. D. Case of Ashtabula, who shall report at 11 A. M., on the second day of the session at the next meeting of this Society.

The Committee on Finance presented a resolution that hereafter the salary of the Treasurer and Librarian shall be $125, which, after discussion by Drs. X. C. Scott, E. H. Hyatt and others, was adopted with but one dissenting vote.

The next business was the election of President, and Dr. John McCurdy of Youngstown was duly elected.

The Committee on Nominations made the following report, which was adopted, and the persons named for the several offices were duly elected:

1st Vice-President—Dr. W. J. Conklin, Dayton.

2d Vice-President—Dr. A. W. Ridenour, Massillon.

3d Vice-President—Dr. C. W. Tangeman, Cincinnati.

4th Vice-President—Dr. J. E. Woodbridge, Youngstown.

Secretary—Dr. G. A. Collamore, Toledo.

Assistant Secretary—Dr. E. C. Brush, Zanesville.

Treasurer and Librarian—Dr. T. W. Jones, Columbus.

Member of Committee on Finance for 5 years—Dr. W. S. Hough, Cuyahoga Falls.

Member of Committee on Ethics for 5 years—Dr. H. S. Upson, Cleveland.

Member of Committee on Publication for 5 years—Dr. J. F. Baldwin, Columbus.

Member of Committee on Legislation for 5 years—Dr. Starling Loving, Columbus.

Member of Committee on Admissions and Medical Societies for 5 years—Dr. D. J. Merriman, Painesville.

The Society selected Columbus for the place of the next meeting, and appointed as the time of meeting the first Wednesday in June.

A paper was read by Dr. H. S. Upson of Cleveland on "Localization in Diseases of the Spinal Cord," and a patient affected with syringo-myelia was exhibited, upon whom the various diagnostic tests between this disease

and locomotor ataxia and other spinal diseases were employed.

A paper was read by Dr. A. B. Thrasher of Cincinnati on "Laryngeal Phthisis."

A paper was read by Dr. A. R. Smart of Toledo on "Phlebitis."

Discussed by Dr. J. Bennitt.

A paper was read by Dr. O. Everts of College Hill on "Nature and the Supernatural from a Medical Standpoint."

On motion of Dr. E. H. Hyatt, it was voted that the salary of the Secretary shall hereafter be $125.

A paper was read by Dr. R. B. Hall of Cincinnati on "Ten Consecutive Cases of Abdominal Section for the Removal of the Uterine Appendages, for the Relief of Pain and the Recurrent Attacks of Pelvic Inflammation."

Discussed by Dr. R. A. Vance.

Society adjourned to 9 A. M., May 24.

THIRD DAY—MORNING SESSION.

The Society met at 9 A. M., President Conner presiding.

The minutes of the previous session were read and approved.

The following delegates to the American Medical Association were appointed: Drs. D. P. Allen, A. R. Baker, J. Bennitt, H. J. Herrick, W. J. Scott, X. C. Scott, H. S. Upson, R. A. Vance, F. J. Weed of Cleveland; S. C. Ayres, P. S. Conner, J. D. Jones, E. S. McKee, J. Ransohoff, T. A. Reamy, C. W. Tangeman, A. B. Thrasher, J. T. Whittaker, P. Zenner of Cincinnati; D. T. Gilliam, J. W. Hamilton, W. D. Hamilton, H. Hendrickson, D. N. Kinsman of Columbus; W. C. Chapman, G. A. Collamore, A. DeVilbiss, S. F. Forbes,

C. A. Kirkley, A. R. Smart, S. S. Thorn of Toledo; W. J. Conklin, G. Goodhue, J. C. Reeve of Dayton; W. S. Battles of Shreve; C. E. Beardsley of Ottawa; A. H. Brundage of Xenia; E. C. Brush, H. Culbertson of Zanesville; W. L. Buechner, R. D. Gibson, J. McCurdy, J. E. Woodbridge of Youngstown; E. Conn, W. C. Jacobs, T. McEbright of Akron; T. A. Dickey of Middletown; A. M. Duncan of Bucyrus; A. Dunlap of Springfield; O. Everts of College Hill; C. M. Galloway of Xenia; Samuel Hart of Marietta; E. H. Hyatt of Delaware; B. B. Leonard of West Liberty; D. J. Merriman of Painesville; Dan Millikin of Hamilton; P. P. Pomerene of Berlin; R. C. S. Reed of Stockton; R. H. Reed of Mansfield; A. W. Ridenour of Massillon; J. D. Robison of Wooster; L. B. Santee of Marlboro; H. J. Sharp of London; E. Sinnett of Granville; J. S. Wood of Collinwood.

A paper was read by Dr. A. M. Duncan of Bucyrus on "Palatable Medication." Discussed by Drs. A. R. Smart and W. S. Battles.

A paper in blank verse was read by Dr. W. S. Battles of Shreve, on "The Physician and Surgeon."

On motion of Dr. H. M. Fisher, Dr. Battles was requested to furnish a copy of the paper for publication, and on motion of Dr. D. J. Merriman, Dr. Battles was invited to deliver a poem at the next meeting of the Society.

The Committee on Admissions having reported favorably upon the nomination of Dr. Victor C. Vaughn of Ann Arbor, Michigan, to honorary membership, he was duly elected an honorary member of the Society.

Dr. A. R. Smart presented the following amendment to the Constitution:

Article III, Section 9 (additional section). Any member of thirty years' standing, who has paid dues con-

tinuously, shall be declared a permanent member without further payment of dues.

The amendment was adopted by a vote of more than four-fifths of the members present.

In the matter of the "Revision and Publication of the Pharmacopœia of the United States," it was voted to take no action.

The following is the consolidated report of the Committee on Admissions and Medical Societies, which was adopted, and the following were elected members of the Society:

NAME.	P. O. ADDRESS.	WHERE GRADUATED.
Aschman, G. A.	Youngstown,	Zurich, Switzerland, Bellevue Hosp. Med. College.
Brown, J. S.	Mecca,	Cleveland Med. College.
Clarke, Ida	Youngstown,	Women's Med. Col. of Pa.
Cobb, Charles	New Athens,	Practitioner.
Collins, H. O.	Dayton,	University of New York.
Cone, J. E.	Youngstown,	University of Iowa.
Fleming, Ellis	Wingett Run,	College Phys. and Surg., Keokuk, Iowa.
Griswold, E.	Sharon, Pa.,	Jefferson Med. College.
Hare, G. A.	Mt. Vernon,	University of Michigan.
Hare, Jessie D.	Mt. Vernon,	University of Michigan.
Harmon, F. M.	Cleveland,	University West. Reserve.
Hobbs, W. A.	Mineral Ridge,	University of Michigan.
Hubbard, Thos.	Toledo,	University of Pennsylva'a
McCandless, M. D.	Youngstown,	University of Michigan. Jefferson Med. College.
Marshall, S. A.	Jeffersonville,	Ohio Medical College.
Pomerene, Joel	Mt. Hope,	University of Wooster.
Quirk, H. W.	Burton,	University West. Reserve.
Rogers, J. H.	Louisville,	University of Wooster.
Tressel, J. H.	Alliance,	Jefferson Med. College.

The committee find that the following societies are represented by delegates:

Brown County Academy of Medicine—W. A. Dixon.

Cincinnati Medical Society—R. B. Hall.

Cuyahoga County Medical Society—R. A. Vance, B. L. Millikin.

Mahoning County Medical Society—J. S. Cunningham, G. A. Aschman.

Montgomery County Medical Society—H. O. Collins, R. H. Grube.

North Central Ohio Medical Society—W. S. Battles.

Northeastern Ohio Medical Association—B. B. Loughead, G. L. Starr, R. S. Hubbard, T. C. Miller.

Portage County Medical Society—J. Price, F. C. Applegate.

Summit County Medical and Surgical Society—E. W. Howard.

The minutes of the session having been read and approved, President Conner closed the meeting with the following remarks:

The hour has come for our adjournment, and I desire to express my sincere thanks for the honor you have conferred upon me, and my great feeling of obligation for the courtesies I have received during the year. I am sure we can gratify ourselves that we have had a very exceedingly interesting meeting, medically considered, and we are under many obligations to our friends in this beautiful city of Youngstown for the attention shown us, individually and collectively. I am quite sure I echo the voice of every member of the Association in saying that our visit to Youngstown has been one of much pleasure and long to be remembered; and as your presiding officer, I again thank you for your kindness, your courtesy and your consideration, and I trust the earth may give of her bounty to each and every one of yon during the coming year, and that we may *all* meet in Columbus in June, 1890.

The Society then adjourned to meet in Columbus on the fourth day of June, 1890, at 2 P. M.

G. A. COLLAMORE, *Secretary,* P. S. CONNER, *President.*

LIST OF AUXILIARY SOCIETIES.

WITH DATE OF ADMISSION.

Academy of Medicine of Cincinnati.....1875
Adams County Medical Society.....1888
Allen County Medical Society.....1867–1887
Ashland County Medical Society.....1865
Ashtabula County Medical Society.....1878
Bay City Medical Society.....1880
Belmont County Medical Society.....1887
Brown County Academy of Medicine.....1877
Butler County Medical Society.....1852
Central Ohio Medical Society.....1869
Champaign County Medical Society.....1853–1879
Cincinnati Medical Society.....1875
Clarke County Medical Society.....1848–1852–1877
Clermont Medical Association.....1854
Clinton County Medical Society.....1879
Columbus Medical Club.....1885
Cuyahoga County Medical Society.....1879
Erie County Medical Society.....1850–1877
Gallia County Medical Society.....1884
Geauga County Medical Society.....1882
Green County Medical Society.....1888
Hardin County Medical Association.....1884
Harrison County Medical Society.....1887
Hemstead Academy of Medicine.....1885
Highland County Medical Society.....1877
Holmes County Medical Society.....1869
Jefferson County Medical Society.....1859
Lake County Medical Society.....1885
Lawrence County Medical Society.....1877

Lebanon Medical Society.....1879
Licking County Medical Society.....1877
Madison County Medical Society.....1881
Mahoning County Medical Society.....1879
Marion County Medical Society.....1879
Meigs County Medical Association.....1850
Miami County Medico Chirurgical Society.....1851
Miami Valley Medical Society.....1879
Monroe County Medical Society.....1887
Montgomery County Medical Society.....1851
Muskingum Valley District Medical Society.....1886
North Central Ohio Medical Society.....1881
Northeastern Ohio Medical Association.....1870
Northwestern Ohio Medical Association.....1869
Pickaway County Medical Society.....1856–1878
Piqua Society of Clinical Medicine.....1886
Portage County Medical Society.....1869
Preble County Medical Society.....1849
Ross County Medical Society.....1876
Sandusky County Medical Society.....1880
Seneca County Medical Society.....1854–1879
Shelby County Medical Society.....1852
Stillwater Medical Society.....1873
Summit County Medical and Surgical Society.....1886
Toledo Medical Association.....1857
Trumbull County Medical Society.....1868
Tuscarawas County Medical Society.....1851
Union Medical Association of Columbiana and Adjoining Counties.....1879
Washington County Medical Society.....1886
Wayne County Medical Association.....1850
Wood County Medical Society.....1877
Zanesville Academy of Medicine.....1886

OHIO STATE MEDICAL SOCIETY.

At the Seventeenth Annual Session of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

DR. PHINEAS SANBORN CONNER.

Dr. Phineas Sanborn Conner (son of Dr. Phineas S. and Eliza S. Conner) was born at West Chester, Pennsylvania, August 23, 1839. When two years old his parents removed to Camden County, North Carolina, and three years later to Cincinnati. In 1855 he entered Dartmouth College (Hanover, New Hampshire) and graduated in July, 1859. Twenty-five years later the college conferred upon him the honorary degree of LL.D. Attending medical lectures at the Medical College of Ohio during the session of 1858–9, and at Jefferson Medical College in 1860–1, he received the degree of M.D. from the latter institution in March, 1861. Eighteen months of his student life were spent at the Retreat for the Insane at Hartford, Connecticut. For six months after graduation he was in New York attending hospitals, and in November, 1861, having passed the Army Medical Board, he was assigned to duty as Acting Assistant Surgeon United States Army at Columbian Hospital, Washington, being commissioned Assistant Surgeon United States Army in April, 1862. In August, 1866, he resigned, having served in Washington, in the Department of the Gulf, at Fort Columbus (New York Harbor), and in the Department of North Carolina. He was brevetted captain and major United States Army for "faithful and meritorious services during the war." Settling in Cincinnati, he was soon after appointed Professor of Surgery in the Cincinnati College of Medicine and Surgery, and a year later Professor of Chemistry in

the Medical College of Ohio. In 1869 he was transferred to the chair of Surgical Anatomy, later to that of Anatomy, and, in 1887, to the chair of Surgery. In 1878 he was made Professor of Surgery in the Dartmouth Medical School and still retains his chair there, delivering his lectures during the summer. He has for over twenty years been on the staff of the Good Samaritan Hospital, and, since 1874, on that of the Cincinnati Hospital. He has been a member of the Ohio State Medical Society since 1868.

PRESIDENT'S ADDRESS.

BY PHINEAS SANBORN CONNER, M.D., LL.D.

As is the appendix to the intestinal tract, a useless survival of a once important organ, so is the presidential address to the annual proceedings of the State Medical Society. In the days when books and journals were few, communication slow, professional work physically harder than at present, there was, I doubt not, good reason for requiring of the recipient of high honor an abstract of the year's progress, suggestions of work that might and should be done, or report of diseases and injuries carefully investigated and successfully treated. But now, when to each one of you what a few months ago appeared in print in San Francisco, in Boston, in Vienna, in St. Petersburg, is already an old story, when in every county there are many men of excellent education and thorough training as observers and practitioners, when measures of public health and professional regulation are everywhere familiar subjects of thought and discussion, it may well be asked of the inaugural address, *cui bono?* Hardly yours; surely not his to whom the month's long prospect of its preparation is the fly in the ointment of the apothecary. But custom is imperious; we are all its slaves; like my predecessors, I obey its mandate.

The year that has just closed, unmarked by any epoch-making discovery in either medicine or surgery, has been one of busy work at home and abroad. In our own country laboratory investigations have been carried on as

never before, increased opportunities have been afforded for bacteriological study, vivisections have thrown light upon some obscure conditions, and from carefully prepared papers and analytical debates the profession at large has derived much valuable information as to the causes, the progress, the treatment therapeutic and operative, of the maladies and lesions of bones, joints and viscera. Perhaps never before in America has there been held so important a meeting as that of the Congress at Washington in September last, when, in addition to the special work in the several societies, two general sessions were devoted to the consideration of intestinal obstructions and cerebral surgery. With the results of the year's labors of home and foreign physicians and surgeons you are all familiar, and it would be as useless as unwise at this time to enter upon any review of them.

But the occasion may well be considered a fitting one in which to turn attention to our own Society and briefly consider why it exists and what it ought to be able to accomplish. Speaking generally, its office is to promote the highest interests of medicine; primarily within the geographical limits of the state, secondarily in the country at large. This it must do by upholding and advancing professional honor and dignity, by aiding in the diffusion of medical knowledge, and by giving moral and material support to all legitimate efforts to increase the public weal by diminishing disease and caring for its subjects. That it may exert any amount of influence upon the profession or the people of Ohio, its membership must be sufficiently large and generally distributed to at once enlist the sympathies and command the respect of the great mass of physicians in every section of the state. Is it so at present? Of about 4,000 doctors having no creed, bearing no limiting designation, the names of 516 appear on the roll published in the last volume of

'Transactions.' Contrast this with the 1,700 members of the Massachusetts Medical Society out of a total of about 2,000 physicians in the state. Of the 88 counties of our state, nine are unrepresented; in each of 11 there is but a single member; of 12, two; of 11, three; so that in 43 counties (but one short of half of the entire number) there are only 68 physicians connected with what has for nearly fifty years claimed to be the Ohio State Medical Society. One-third of our members are residents of one or other of six counties. For every reason measures should be adopted to bring into the Society a very large number of new men. Would it not be wise to so amend our organic law that every regular physician connected with any local medical society should in virtue of such membership belong to the state society, leaving to after action of the Society all matters of detail, especially financial? Our auxiliary, county and local societies are far too few in number, and are yearly becoming fewer. Many are practically in a state of suspended animation. This state of things should not be allowed to continue. An active-working district or county society is to every member the best post-graduate school, and a great promoter of harmony and good friendship. In no other profession is it more true that "United we stand, divided we fall," in public estimation.

In years past no small part of the time of our meetings has been taken up in the consideration of what has been called "the regulation of medical practice," and more than once the Society has given its sanction to bills presented or to be presented to the Legislature, intended to prevent practice by incompetent men. Whatever can make the physicians of Ohio better diagnosticians and more successful carers for the sick and the injured, is to be sought for and secured if possible; and it is the duty of everyone to do whatever may lie in his power to pre-

vent illy-prepared men entering upon the study of medicine, and all from supporting schools lacking in mental and material qualifications for good and thorough instruction. But beyond this, I have grave doubts as to the wisdom of interference. The current is setting strongly all over the country towards legal restrictions and state supervision, and it is to be hoped that this voice of the people is the voice of God, not, as it sometimes is, a *vox diaboli.* Certainly it is not wise for medical men to be constantly decrying the practitioners of medicine; and the oft-repeated statement that the profession is full to overflowing of those ignorant and incompetent, has already produced a decided impression upon the public mind. The statement is not a true one. There are men who know little enough, and some of them are among the loudest talkers; but the doctors of the state of Ohio, taken as a whole, are the intellectual, moral and social equals of the ministers, the lawyers, the merchants, the farmers of the state. The people of Ohio have to-day as good physicians as they ask for, are, in fact, entitled to. When they demand better and support better, then, and not till then, will they have better. The sooner we quit denouncing and the earlier we begin harder study, closer observation and more watchful attention, the better for us and for all. More medicine and less medical politics is, as I look at it, the want of the times in America.

A very important and much-neglected field, in which work may and should be done by a society like ours, is that of collective investigation. With a large membership and an auxiliary society or societies in every county, it would be comparatively easy to determine the actual and relative prevalence of many constitutional and local diseases, with data bearing upon causation, duration and the effects of treatment, and to collect valuable statistics of operations for injury and disease. In this la

tioned work a good example has been set by the state society of Texas. Special committees upon selected diseases might with propriety be appointed at each annual meeting, to whom the various county reports should be forwarded thirty, sixty, ninety days before the next annual meeting, and by whom such reports should be consolidated and prepared for publication, a brief extract only being presented in open session. Who can estimate the present value of a series of annual reports for the past forty years of the number of cases, the ages of the patients, and the deaths from consumption, cancer, rheumatism, pneumonia, stone and the major amputations and excisions in each of the counties of the state, if we had them? This Society and this Society alone could secure such reports, and that with comparatively little trouble, if our membership was, as it ought to be, co-extensive, or nearly so, with the practitioners of the state. May I be pardoned if I suggest in this connection that the papers read in the yearly meetings should be short, clear statements of what the writers have themselves observed, studied and done, leaving to the hearers, as disposed, investigation into the literature of the subject and comparison of theories, conflicting opinions, and, it may be, antagonistic measures of treatment; or at least, if such has been embraced in the paper, omitting it all in the reading to duly appear in the printed 'Transactions'? Every busy man in listening to a medical or surgical paper says to himself, "Never mind the items; give us the total," reserving for some leisure hour the careful reading of the elaborate article or the extended study of the subject treated.

By no means the least of the good things that come from such an organization as ours, and its annual meeting, are the acquaintances that are formed and the friendships that are made. The life of the medical man is in many

respects a peculiar one, and inevitably tends in greater or less measure to make him self-contained and, as a result, self-limited. A few days' interruption of the sober routine of life, an opportunity to meet agreeable persons of like pursuit and kindred tastes, a chance to hear of new things or of old ones presented in a new way and viewed from a somewhat different stand-point, these are among the pleasures of life especially enjoyable and of advantage to one ever on duty, whose social life, even at his own fireside, is restricted, interrupted, uncertain. If not a paper was read or a resolution discussed, a gathering of the clan once a year would be well worth the time, the trouble and the cost; and the larger the assemblage, the wider the territory from which it is summoned, the greater the benefit of the meeting, the deeper the satisfaction resulting therefrom.

However indisposed one may be to take medicine, such tonic and such alterative clear the brain and strengthen the heart.

But with every joy of life there is a mingled sorrow; as year by year we meet old friends and new ones, we miss familiar faces. Some hand is vanished, some voice is still. He to whom I expected a year ago to transfer the chair of office during these passing moments has penetrated the mystery behind the veil, has learned, we may trust, why sickness and sorrow and death are the appointed lot of the sons of men. Earnest, honest, faithful, able, he finished his life-work at fifty-seven, and there remain with us only a memory and the undying influence of good deeds.

REPORT ON CASES OF THE ALEXANDER OPERATION.

BY D. TOD GILLIAM, M.D., COLUMBUS.

It is not the purpose of this paper to discuss the Alexander operation, either to advocate or decry it, nor yet to marshal an array of cases to swell the statistics, but simply and briefly to report a few cases, the chief interest of which lies in the fact that ultimate good followed in such as were stamped as failures at the time of operation. I may here say that in all the ligaments were found, but in all likewise there existed a marked disparity in size and strength on opposite sides. The operative failures were due to the rupture of the ligaments either from inherent fragility or from the inordinate force necessary to overcome the adhesions. In a certain proportion of cases the breaking of ligaments is not to be obviated, and therefore this is to be classed among the unavoidable accidents of the operation. Neither can this accident be foreseen nor guarded against, as it occurs in patients of every type of constitution and every phase of physical condition. This, it must be admitted, constitutes a serious drawback to the operation, and, if (as in my own experience) several cases occur in succession, is well calculated to work disgust and discouragement. Should such a congeries of misfortunes attend the early efforts of an operator, it is easy to see how it might lead to the abandonment of this line of practice. I confess that I was both disappointed and disgusted and began anew to consider the *pros* and *cons*

ab origo. In this frame of mind I wrote to Munde, than whom probably no one in this country has had a larger or more diversified experience. In reply he says, "Your recent experience reminds me very much of my early and also my recent experiences. I have felt just as you have, but now I know that I can always find the ligaments, even though they may break or not run in the canal by reason of adhesions. Herein lies the chief objection to the operation." He then goes on to affirm his faith in the operation and abjures me to not become discouraged nor give it over.

It is hardly necessary at this day to describe the operation *in extenso*, but inasmuch as many of the text-books make no allusion to it, a brief description may not be amiss. As a preliminary, it is absolutely essential that all adhesions be broken up and the uterus placed in the normal position. It is a good plan to hold it so by a well-adjusted pessary during the operation, especially in the absence of a skillful assistant, as this obviates the introduction of the finger in the vagina during the act. The patient being laid flat on the table and the pubis shaved, the operator takes his position on the side opposite to that to be operated on. First with the finger locate the spine of the pubis and cut boldly down on it, extending the incision one and a half to two inches in the direction of the anterior-superior spinous process of the ilium. In this way the external ring of the inguinal canal is reached and a knuckle of fat protrudes. This latter, being carefully divested of its investing membrane, is seized with broad tissue forceps and lifted up, when it is grasped by the thumb and forefinger of the left hand. By spreading it over the end of the finger, and rolling between them, the ligament is recognized first by the touch and then by the eye. It is now separated and drawn out, and a sponge dipped in

antiseptic solution laid over the wound, and the other side dealt with in like manner. The redundant fat is now cleared away, the hemorrhage staunched, and the wound thoroughly cleansed by antiseptic irrigation. The ligament is now stitched to the pillars of the external ring, preferably by silk-worm gut suture, the frayed ends cut off, and the remainder tucked away in the wound. A drainage tube is introduced into the canal extending outward along the bottom of the wound, and the latter closed by interrupted silk suture. A fold of iodoform gauze, held in place by adhesive strips, completes the dressing. The patient is put to bed with the knees flexed. In all this two precautions are always observed: first, to abstain from any act or maneuver by which the knuckle of fat will be disturbed in its relations or pushed back into the canal, and second, to preserve the moorings of the ligament at the pubic bone until it shall have been secured, drawn out and made fast by suture to the pillars of the external ring. I hereunto append a brief history of three cases, which, through rupture of the ligaments, were at the time classed as failures, but which unexpectedly gave gratifying results.

Case I. Mrs. Catherine G., age 27, married, has had two living children, the youngest being three years of age. Attributes the commencement of her trouble to a miscarriage at seventh month five years ago. Complains of pain in the head, stomach and back, and radiating pains extending down right thigh. Menstruation regular but painful. On examination find retroversion of uterus and prolapses of right ovary, the latter being somewhat enlarged and very tender. Uterus adherent. The adhesions were broken up by the Schultze method, and the fundus brought forward to the abdominal walls; operation Saturday, January 12, 1889. The ring was exposed by one sweep of the knife and the other steps of the opera-

tion as described above. The ligament of the right side was about the size of a chicken quill, that of the left being not larger than a knitting needle. Both were quite firmly adherent, and much tact was used in liberating them, the left breaking in the act. An injudicious attempt to bring the uterus snug against the abdominal wall caused the right to break also. In this case an erysipelatous inflammation ensued, with suppuration, extending between the muscular layers on the right side as far as the hypochondriac region. An examination made ten days after the operation revealed the uterus in the normal position, which it continued to maintain up to the time of discharge, which, owing to a tedious convalescence, was several months after. The patient improved greatly and was sent home feeling quite herself again.

Case II. Mrs. Martha B., age 27; has had two miscarriages, suffers from pelvic pains and dragging at loins, find uterus completely retroverted, with adhesions, adhesions broken up under ether and uterus replaced. Monday, March 10, there being no reaction from the preceding Saturday's work, cut down upon left ligament, which was found without difficulty and of fair size. Traction to overcome adhesions resulted in its breaking high up in the canal. The right ligament proved to be very slender, but was brought out one and a half inches, though it could not be made to run. The wounds were closed in the ordinary manner. March 17, examination reveals the uterus in the normal position, which it maintained to the day of discharge, six weeks later, though no pessary was adjusted. This latter was purposely deferred until the day of discharge, to test the staying qualities of the uterus in the normal position.

Case III. Rebecca M., age 32. Married. No children. One miscarriage. Four years ago fell across the back of a chair, since which has been confined to bed

most of the time. Find the uterus retroverted, which being replaced and a pessary introduced, gives marked relief. Not wishing to be dependent on the pessary, she chose the more radical relief by the Alexander operation. Accordingly, on the twenty-fifth day of March, the operation was performed at St. Francis hospital. Both ligaments gave way after being drawn out about two inches. Suppuration ensued, and she was kept in bed about five weeks. Repeated examination showed the uterus firmly in place, and any attempt at retroversion was accompanied by dragging and pain at the hypogastrium. Before being sent home a pessary was adjusted. Two weeks ago I heard from her by letter. She stated that the wound had opened and was discharging, and that the supporter felt as if coming away. Yesterday I saw a physician from her place, who informed me that she was going about.

These patients have all passed from under observation, and, with one exception, the last, I have been unable to strike communication with either of them. I will not be so bold as to say that these patients are permanently cured, neither will I venture a prediction as to the ultimate outcome, but, to say the least, the results are striking and suggestive. Neither do I know how to explain the phenomena, except on the ground of spastic contraction of the ligaments under the influence of peripheral irritation, incident to operative interference. This, of course, presupposes that the adhesions within the canal have not been entirely broken up, or that new ones have been contracted during the healing process. We have analogous conditions in the spastic contractions of the muscles of the extremities and in the condition of torticollis, but more especially in the contractions of the spermatic cord in urethitis. Should future observations prove these conditions lasting, and their induction practicable, a suggestion for the use of electricity or other form of local irritation is clearly patent.

CLINICAL NOTES ON REFRACTIVE CASES.

BY B. L. MILLIKIN, M.D., CLEVELAND, O.

Conclusions which are based upon the largest clinical experience become of the most value to the practicing physician in any line of medicine. He who has carefully observed any large class of cases of disease, and who has studied them in detail throughout the course of their progress, must have acquired some definite information which is of interest to at least some members of his profession. The subject of refractive errors is not a new one, but as the physician comes year by year laden with new facts and new observations on the good old subjects of typhoid fever, diphtheria or tuberculosis, and tries to help his fellow-workers, so we think a few data upon this subject, which is not without moment to the profession at large, as well as to the community in general, may possibly help someone to solve some perplexing case, which has put him to his wits' end to know what to do next for the relief of his patient.

What I shall have to say upon refractive cases will be entirely from the clinical stand-point, and is based upon a series of cases which have been pretty closely observed and carefully worked out in my private practice, and of which I have full and complete notes. The total number of cases of which I am thus able to make use is 576. I have taken the trouble to make out a somewhat complete tabulation of different varieties of the errors of refraction, which, on account of lack of time, is not here

submitted. Briefly, of the 576 cases, 213, or nearly 37 per cent., were hypermetropic; 78, or 13 per cent., were myopic; 179, or 31 per cent., had hypermetropic astigmatism; 50, or nearly 9 per cent., had myopic astigmatism; 25, or about 4 per cent., had mixed astigmatism; 15, or nearly 3 per cent., had unusual forms of astigmatism; 12, or 2 per cent., had angles differing from one another in the two eyes, from 45 degrees to 90 degrees.

It thus seems that hypermetropia and hypermetropic astigmatism apparently vastly preponderate as refractive errors; and no doubt this is the case, taking the cases which consult the ophthalmologist; but we know from authors that among adults myopia is the more common form of error. These cases, as a rule, suffer no discomfort, and their only inconvenience is in not being able to see well, and for this they are generally treated by the neighboring jeweler or optician.

The symptoms which characterize the errors of refraction of the hypermetropic or astigmatic varieties, and for which the physician and ophthalmic surgeon are consulted, may be divided into the local, or those affecting the eyeball and its appendages, and the remote or reflex. Under the head of local troubles we may enumerate inflammatory conditions of the lids, the cornea and the retina. In this class we may have styes, recurring again and again, obstinate disease of the borders of the lids with loss of the eye-lashes, marginal blepharitis, conjunctivitis, recurring ulcers of the cornea and hyperæmias very closely simulating inflammatory infiltrations of the retina and disc—a neuro-retinitis. These conditions are very frequent as the secondary results, we might say, of hypermetropia and astigmatism. These inflammatory conditions are often very persistent, and I have very frequently had patients who have suffered with repeated attacks of styes, marginal blepharitis with loss of lashes, relieved entirely

by no other means than the full correction of the refractive errors. But no one will deny that other causes may exist for these various conditions, such as some constitutional dysarasia, but it is well to be on one's guard, in all protracted or recurring cases especially. So, too, I have notes on several cases who have for years had, at intervals, attacks of ulceration of the cornea, coming on from over-use of eyes suffering from astigmatism, which have been greatly relieved by correcting the refraction and the tendency to recurrences abated. I have seen many times eyes in which one would say there was a neuro-retinitis from an ophthalmoscopic examination, did we not know how prone an astigmatism is to produce a hyperæmia of the retina, when the patient does much prolonged near work. These cases, almost without exception, clear up speedily under proper glasses. So much for these circulatory disturbances, as we may call them.

The second class of symptoms to which I wish to call your attention briefly, is pain in the eyeballs, about the eyes, headaches in the frontal, temporal and occipital regions, and even sickness at the stomach, with vomiting, dizziness, etc. Of the 576 cases, 139 had pain in the eyeballs as distinct from headaches or pain in the peri-orbital region, and no less than 294 cases had distinct histories of headache. In other words, pain in the eyes or head, upon prolonged near use of the eyes, was a distinctive feature in the vast majority of these cases, and excluding the cases of simple myopia, in which we do not generally look for pain as a symptom, we may lay it down as a rule that pain, after prolonged use of the eyes for near work, indicates either hypermetropia or astigmatism. The character and history of these cases of pain in the head are so definite that we can very often diagnose a case as one either of hypermetropia or astigmatism without making any examination whatever.

When a patient comes to you with a history of pain coming on in the eyeballs, in the frontal or temporal region, often radiating to the occiput, after severe or prolonged use of the eyes for near work, which is relieved by rest or a night's sleep, you may be almost sure that the trouble is due to eye-strain. Many of the children of our public schools and colleges will tell you that during the school work they suffer more or less from headaches, that these headaches are usually more severe and more frequent towards the close of the term's work, or about examination time, and especially toward the close of the school year; that they are quite free from them in their vacations, especially the long vacation, and that as they grow older and study harder they suffer with more pain. Another but much less numerous class of cases will tell you that they have never suffered with their eyes in the least, but that while doing moderately hard work the eyes have suddenly given out, the page appears quite blurred when they attempt to read, and they can do no near work whatever, and now suffer very great pain upon the slightest attempt to use the eyes near by. These are cases of asthenopia, depending upon a sudden giving out of the muscle of accommodation from over-fatigue, due primarily, as a rule, to hypermetropia, and occurs mostly in children or younger persons. No doubt many of you have seen occasionally the fingers or the wrist of the musician who practices incessantly upon the piano or violin, give out in the same way from this undue exercise. Absolute rest of the eyes from all near work, with atropia to make the rest more certain, the correction of any refractive error, the building up of the general system if below par, will be the means for promoting a cure. The degree of the refractive error, so far as I have been able to judge, does not seem to bear any definite relation to the amount of pain or discomfort either in the eyeballs or head. Many

of the most persistent and troublesome cases of neuralgic disturbance are found to depend upon very slight refractive errors indeed; while other cases, with high astigmatic and hypermetropic errors, have suffered little or no discomfort. Why this is so I am unable to state, unless it depends upon some peculiar personal nervous sensibility, which renders some patients especially susceptible to slight irritations. Not a few cases suffer from pain and headaches from a defect which, while not a refractive error, is corrected by means of glasses—I mean muscular insufficiencies—and these constitute a very important and often greatly suffering class of patients.

Time forbids my entering more at large into an examination of these cases, but I hope to be able, on some future occasion, to make a more careful analysis of the relations of muscular and refractive errors to headaches, vertigo, etc. The visual disturbances do not bear any certain relation to the conditions which develop most pain, for many cases, with perfectly acute vision, may suffer most intense discomfort, and I am inclined to think the cases with only a moderate degree of astigmatism, in which distant vision is not at all or only slightly affected, are generally the most troublesome and productive of most headache. Because vision, therefore, even with tests, is perfectly normal in acuteness for distance, and the accommodation good near by, it is no proof that there may not be a latent astigmatism or hypermetropia, which is the basis of headaches and ocular discomfort.

Relief for the vast majority of these cases is certain and complete by the proper adaptation of glasses. The pain in the eyes, the headaches, the whole general nervous irritation which is often almost unbearable, all disappear as if by magic, and work which heretofore surely has brought misery and distress becomes a source of much pleasure. I have, over and over again, had cases which

have been treated for years for persistently recurring attacks of pain and headaches, supposed to be due to stomach or bilious disturbances, relieved entirely by the correction of an astigmatism or hypermetropia. I know of no way by which I can more forcibly illustrate some of the remarks I have already made, than by reporting as briefly as possible two or three striking cases, of which I have full notes.

Case I. G. W. A., aet. twenty-eight, married, teacher of organ music, gives the following history: When a student in college never had any trouble either with eyes or headaches, but for about three years has complained of becoming "near-sighted," and of having headaches in frontal and occipital regions of head, very severe at times, always relieved by sleep. With the headaches has many peculiar and annoying nervous disturbances, and these symptoms have gradually increased, especially during the past few months. The nervous disturbances consisted in his being unable to look persons in the face when talking with them, and a dread of meeting people. In his teaching he would often be obliged to dismiss his pupils, go home, and shut himself up in a dark room and lie down, in order to get any comfort whatever. There was much photophobia, pain upon trying to read, etc. His trouble became so bad that he was obliged to give up half of his work, and his friends feared nervous prostration and even despaired of his mental soundness. He became pale, lost flesh and appetite, was restless and irritable; the least exertion or muscular exercise became irksome and excessively fatiguing. He did not suspect that he had anything more the matter with the eyes than a little near-sightedness. For two or three years he had been under the supervision of one of the most careful medical gentlemen in northern Ohio, who had prescribed rest and medicines, but seemingly to no purpose, and

finally brought him to me for an examination of his eyes. The ophthalmoscope showed slight choroidal crescents to outer margins of both discs, a very moderate astigmatism, but fundus of either eye otherwise presented a very fair condition. I advised the use of atropia and carefully testing for any slight error there might be in the refraction. A week later he returned, after having used a 4-grain solution of at. sulph. t. d., and reported that immediately upon beginning the use of the atropia, it seemed to him as if a great load had been lifted from him, and the former marked disagreeable nervous symptoms had disappeared. The testing of the refraction gave the following result:

O. D.—0.50D.S. ⌒—0.50D. cy. ax. 140° V=6/6

O. S.—1.00D. cy. ax. 35° V=6/6

This combination was ordered to be worn all the time, and the amount of near work was to be absolutely confined within the limits of what could be done with comfort. Two months later the patient returned, reporting himself almost free from headaches, except once or twice after over-working, the annoying nervous symptoms as having disappeared, and in the meantime he had gained no less than twenty-five pounds in weight. He has steadily improved ever since, and is now able to do any ordinary amount of work without fatigue or irritation. It seems almost incredible that so moderate an amount of astigmatism could produce such distressing nervous symptoms, but it is only one of the many examples which force us to the conclusion that the nervous functional disturbances in no wise depend upon the degree of astigmatism, but upon the kind.

It will be seen here that the two cylinders, while comparatively weak, are nearly at right angles to each other, a condition of things most liable to produce excessive nervous irritation.

The next case I submit is one in which there was a combination of simple hypermetropic astigmatism with muscular insufficiency.

Case II. Miss M. G. was referred to me by Dr. H. K. Cushing of Cleveland, for an ocular examination, and gave me the following history: For a number of years she has had trouble with her eyes and after prolonged reading has suffered with severe headaches, beginning usually in the back of the head, but often in and about the eyes. The headaches have frequently been preceded by flashes of light, and have developed into a regular "sick headache," with nausea, vomiting, etc. About a year and a half before I saw her, she had an attack of what she called "cerebro-spinal meningitis," with which she was laid up in bed for a number of weeks, and since then she has been more or less of an invalid. At the time of the examination she was pale, emaciated, very weak and almost entirely confined to her room. A very little reading was sufficient to produce pain and headache. The ophthalmoscope showed no unusual or striking conditions, the discs being rather pale, as we might expect from her anæmic condition. Briefly, an examination under atropia gave an astigmatic refractive error of + 0.50D. The examination with prisms, however, gave a vertical insufficiency of 2°, so that the following combination of glasses was ordered:

O. D. + 0.50D. cy. ax. 80° ⊖ prism 2° base up.

O. S. + 0.50D. cy. ax. 95°.

Shortly after beginning the use of these glasses she placed herself under the care of Dr. S. Weir Mitchell of Philadelphia, who put her on the "rest cure" treatment, and, under the supervision of Dr. DeSchweinitz, had her wear the above glasses constantly. The outcome of the case was most happy. Her general health was greatly improved, she gained twenty-five or thirty pounds

in weight, her headaches disappeared almost entirely, and since her return home has been able to do any ordinary amount of near work with the glasses without discomfort. But the effort of trying to read without glasses immediately produces pain and discomfort.

The third case is one of pure muscular insufficiency.

Case III. H. Z., aet. fourteen, school-boy, has always complained of headaches and dizzy spells since he began going to school, the attacks coming on frequently, and always in the frontal region, often passing into regular "sick headaches," with vomiting, etc. Before coming to me, his father, thinking he was perhaps shamming, compelled him to sit by him and read until his head began to ache and he actually vomited. Examination of the eyes gives O. D. V = 6/6 (?) O. S. V = 6/9 (?) and the ophthalmoscope shows a choroidal ring all round the disc, broadening out into a crescent to temporal side of right eye, and to choroidal ring all round the left disc, and both eyes emmetropic. Under atropia, both eyes were exactly emmetropic, and vision normal, but examination determined a vertical insufficiency of 1°, and a lateral insufficiency of 1°, so that the following glasses were prescribed:

O. D. prism 1° base up.
O. S. prism 1° base out.

With the use of these glasses for near work only, he has been able to continue his study with entire comfort, and the disappearance of all headache, unless he does very severe prolonged work, when his eyes begin to tire.

Of the 576 cases, 250 were examined under a mydriatic, atropia, Duboisia, or Homatropine, mostly the former. This I consider a very important matter, as in the great majority of cases of hypermetropia or astigmatism the absolute error of the refraction is concealed by a spasm of the muscle of accommodation, which renders it impossible to determine accurately the amount of the re-

fractive error, or the exact angle of the astigmatic meridian. In the use of the mydriatic also a word of caution is necessary. I have had a number of cases who have suffered from the toxic effects of each of the three mydriatics above mentioned, so that it will always be wise to give specific directions as to the use of the medicine.

From a consideration of the material with which we have had to do, I think the following conclusions may fairly be made:

1. The refractive errors which are the cause of most discomfort are hypermetropia and astigmatism.

2. These errors, together with muscular insufficiencies, are prolific sources of local inflammations as well as headaches, and sometimes of grave nervous disturbances.

3. All cases of persistently recurring headaches, whether with or without visual disturbances, should be examined for ocular defects.

4. The ophthalmic surgeon should, in all cases suffering from severe pain in or about the eyes, examine for muscular insufficiency as well as for refractive errors.

5. Much better and more satisfactory results will be obtained by making the examinations under complete mydriasis.

6. The more or less constant wearing of properly adjusted glasses will, in the vast majority of cases, give relief to symptoms arising from refractive errors, and in many cases to those from muscular insufficiencies.

EXTRACTION OF CATARACT WITHOUT IRIDECTOMY, OR SIMPLE EXTRACTION.

BY S. C. AYRES, M.D., CINCINNATI, O.

After holding sway for a period of twenty-five years, it seems probable that Graefe's operation for the extraction of cataract is about to give way for another and more successful method.

The operation devised by the brilliant Graefe was a great improvement on the methods in vogue at that time, and statistics go to prove the value of the innovation. But recently there has been a return to the old corneal flap without an iridectomy, and the operation is called Simple Extraction.

The coloboma caused by the iridectomy has long been a source of annoyance to the operator on account of its cosmetic results, and also of some loss in acuity of vision to the patient, from the unnatural size of the pupil.

To extract the lense and preserve the shape, size and activity of the pupil, and at the same time improve the vision, must certainly be the aim of the operator, and must constitute the "Ideal Operation."

It seems now that we are about to accomplish this desideratum, if we have not already done so. Two things have combined to make possible such results as I shall presently mention, and they are: First, Graefe's knife for cataract operation, and, second, antiseptic measures to prevent suppuration.

Whatever may become of Graefe's operation, as it is

known all over the world, his knife is likely to live. It may be modified, but to him will always belong the credit for superseding the old triangular knife by the long narrow blade now in use.

Antisepsis, in its relation to cataract extractions, plays as important a rôle as it does in any other operation. Antiseptic precautions should be carried out with scrupulous care in every case, so as to make the statistics of this operation show the best possible results.

Carefully prepared statistics of surgical operations made by reliable men must have great weight in deciding the propriety and impropriety of any operation. We look to men who have large opportunities for the results of their work. Men in more limited fields must be influenced more or less by those whose fields are more extended.

In cataract operations, the older cities of Europe furnish the largest number *pro rata,* while in our country the eastern cities have apparently more than the western. In considering the results of cataract extractions we must naturally refer to the cases reported by Dr. Knapp of New York city, whose extensive experience in Europe and this country makes his statistics of the greatest value.

He has recently completed his report of one thousand cases, and it is a matter of great interest to see what his results have been, and I shall refer to them hastily. In his third hundred he had 6 per cent. of loss, 3 per cent. of imperfect results, and 91 per cent. of good results, but among the latter not one of them is reported as having perfect vision.

In the fourth and fifth hundred cases, which are reported together, there were a total loss of 11.5 per cent., a moderate result of 6.5 per cent., and good results in 82 per cent.

In the sixth hundred there were a loss of 10 per cent.,

moderate results in 1 per cent., and good results in 89 per cent.

In the seventh hundred there were 5 per cent. of failures, 7 per cent. of moderate results, and 88 per cent. of good results.

In the eighth hundred there were a loss of 2 per cent., moderate results 8 per cent., and good results in 90 per cent.

These operations were done after Graefe's method. The dicission of the capsule was modified latterly, but practically they all come under one class.

The next hundred which he reports were done by the simple extraction, the old method which has been recently revived, without an iridectomy. The increased percentage of good results is at once apparent, as there were in this series a loss of only 1 per cent., moderate results in 3 per cent., and good results in 96 per cent.

Most striking evidence of the superiority of this operation is shown in the number of cases which have a vision of $\frac{20}{20}$, which, in this series, amounted to 21 per cent. This phenomenally good result is due to the fact that Dr. Knapp makes dicissions of the capsule very soon after the extraction is done, and in that way, as an ultimate result, obtains a much higher percentage of perfect sight than he ever did before.

His last hundred cases are still better. He reports here a loss of one case, moderate results in 2 per cent., and good results in 97 per cent. The ultimate result of this series is something unprecedented in the history of cataract extractions so far as my access to reports is concerned.

He has a total result of perfect vision in 30 per cent. This speaks louder, in praise of this operation, than words. It is hard to say how much the final results will be improved, but certainly, so far, the statistics are decidedly in favor of simple extraction without iridectomy.

Simple extraction without iridectomy is not possible in every case. It is not advisable in over-ripe cataracts, nor in cases where there are posterior senechiæ. There are also complicated cases where the old method would be better.

So far I have had only thirty-two cases of simple extraction and I report them for what they are worth. They are certainly encouraging as showing a fair average of good results. The cases are as follows:

1. W. W., age 30. Cataract semi-hard, no complications. Extraction without iridectomy. Spontaneous reduction of iris. No inflammation. Pupil clear, round, central and active. V=0.5.

2. P. R., age 69. Extraction without iridectomy. Spontaneous reduction of iris. No reaction, pupil round and central. V=0.5.

3. J. K., age 52. Extraction without iridectomy. Spontaneous reduction of iris. No reaction, round, central pupil. Cornea nebulous from old keratitis, but vision excellent, considering this complication. V=0.1.

4. Mrs. C. H., age 80. Cataract mature L. E., and hypermature R. E. Operation R. E. Lens removed without complication. There was a small cystoid cicatrix at the inner angle of the wound, but it caused no irritation. No reaction, pupil drawn upward and oval in shape. V=0.1.

5. Operation L. E. In making the corneal section, the free edge of the iris fell over the knife, and in cutting out, the pupil was enlarged slightly upward. I did not excise the iris to its periphery, but completed the operation as usual. No reaction; excellent recovery, with pupil enlarged upward. V=0.1.

6. V. D., age 69. Cataract mature R. E. Simple extraction; spontaneous reduction of iris. Second day wound spread and iris prolapsed. Healed with cystoid cicatrix. Two months later excised cicatrix. V=0.2.

7. Mrs. E. J. C., age 62. Cataract not quite ripe. Extraction without complication. Iris reduced spontaneously. A small quantity of soft, cortical substance remained in the pupil, which was quietly absorbed. Not the slightest reaction. V=0.3.

8. J. M. B., age 68. Extraction without complication. Iris reduced spontaneously. Small quantity of soft cortical substance remained in the pupil. No reaction. On eighth day struck the eye with his hand and panophthalmitis followed and the eye was entirely lost. V=0.

9. Dr. R., age 71. Cataract hypermature, waxy lens. Simple extraction. Spontaneous reduction of iris. The next day his son fainted and fell upon the bed, his hand striking his father's eye. This caused a rupture of the wound and prolapse of the iris—excised iris. Marked chemosis of conjunctiva and infiltration of upper lid. Inflammation subsided in three weeks. Could see objects in the room. V=$\frac{1}{20}$.

10. W. W. E., age 76. Simple extraction. Spontaneous reduction of iris. Large amount of soft cortical substance; some remained. Cystoid cicatrization formed in the course of two weeks. When discharged, cortical absorbing. V=$\frac{1}{20}$.

11. Dr. W. G. R., age 72. Simple extraction. Spontaneous reduction of iris. Pupil clear and round. On the fourth day the wound opened, but iris did not prolapse; closed again in three days. V=0.4. Reads Sn. 2.

12. S. T. H., age 83. Simple extraction. Spontaneous reduction of iris. V=0.2. Reads Sn. 5.

13. Mrs. H. S., age 69. Simple extraction. V=0.2.

14. Mrs. E. C., age 70. Waxy, semi-transparent lens, large and broad. Simple extraction. Rupture of iris at pupillary margin. Large amount of pigment scraped off. V=0.1.

15. M. N., age 82. Lens mature; simple extraction; no complication. Pupil round and active. V=0.1.

16. Miss A. N., age 58. Simple extraction. No inflammation or reaction. Pupil oval but clear. V=0.4.

17. H. H., age 63. Lens mature. Simple extraction. V=0.1.

18. Col. I. H. P., age 79. Simple extraction. Pupil central, round and active. V=0.7.

19. Mrs. M. A., age 29. Prolapse iridis and excision. V=0.1.

20. Mrs. G. K., age 47. Simple extraction. Pupil central, round and active. Vision 0.4 seventeen days after the operation.

21. E. C., age 63. Simple extraction. Lens capsule came out before the lens; removed by slide maneuver. V=0.1.

22. Mrs. M. L., age 62. Simple extraction. Pupil central but irregular from two points of adhesion to membrane. V=0.2.

23. Mrs. F. J. W. Simple extraction. Prolapse iridis and excision. V=0.1.

24. Mrs. S. J. K., age 79. Cataract over-ripe. V=0.1 two weeks after the operation.

25. L. R. H., age 51. Simple extraction. Iris replaced with spoon. V=0.3 ten days after the operation.

26. Mrs. J. P. P., age 74. R. E. blind four years; over-ripe. Spontaneous replacement of iris. Seven days after operation V=0.2.

27. Left eye. Simple extraction. Spontaneous replacement of iris. V=0.2 d.

28. Mrs. L. E. W., age 74. Simple extraction. Spontaneous replacement of iris. Cystoid cicatrix. V=0.2.

29. Mrs. M. H., age 62. Simple extraction, iris replaced with spoon. Prolapse of iris upward and outward during first night. V=0.1.

30. Mrs. S., age 78. Simple extraction. Spontaneous replacement of iris. Small amount of cortical substance remained in the anterior chamber, which underwent absorption slowly. V=0.2.

31. Mrs. F. K., age 62. Simple extraction. Spontaneous reduction of iris. Pupil central, round and active. V=0.4.

32. Mrs. C. C. C., age 62. Simple extraction. Iris replaced spontaneously. V=0.4.

In reviewing the results of these cases, which are all primary, having been made from seven to seventeen days after the operation, they appear satisfactory. In one there was a vision of 0.7; in two, V=0.5; in four, V=0.4; in two, V=0.3; in eight, V=0.2; in twelve, V=0.1; in two, V=$\frac{1}{20}$, and in one a total loss. The latter case did well for eight days, without the slightest evidence of reaction. In the night he struck his eye with his hand, and the next morning his eye was tender and very soon a violent panophthalmitis set in. Such a loss should not fairly be counted, as it was not dependent upon the operation or the operator.

In one case there was a traumatic prolapse of the iris, caused by a son of the patient fainting and falling on him and rupturing the wound. In two cases the prolapsed iris had to be excised. In three cases there was a small cystoid cicatrix, but vision was not materially impaired thereby. In one case there was a nebulous condition of the cornea from old granular lids, which interfered very much with vision. The pupil was central, round and active.

In nearly all the cases, although the notes do not show it, the pupil was round, central and active. In some there were one or more adhesions to the capsule, but not sufficient to alter the shape of the pupil. I have no doubt but that the ultimate vision in these cases could be very much increased by secondary operations.

The strictest antiseptic precautions were carried out in all of these operations. The antiseptic fluid used was that of Panas, which is, Hydrarg. Biniodide one part, alcohol five hundred parts and water twenty thousand parts.

In the first place, the patient's face is washed with this solution and the conjunctival sac flushed with it; the instruments are laid in a bath of the same, and the operator's hands and those of his assistant are washed with it also.

The better plan to pursue in the operation, if you have an assistant who can be depended upon, is to dispense with the use of the speculum entirely. Let the assistant open the lids while the corneal incision is being made, cocaine having been instilled about five minutes before the operation. After the corneal incision, the cystitome is introduced and the lens capsule freely opened. This is one of the difficult steps of the operation, as the lens sometimes comes forward, making it difficult to pass the cystitome over the iris.

It is well to pass the cystitome pretty far down, so as to insure a free incision through the capsule. As it is drawn up, the upper portion of the capsule should be freely opened, then the lids are allowed to close.

The next step is the expulsion of the lens. The patient is directed to turn his eye downward, and then, with the point of the finger, which I prefer, or with the spoon pressed against the lower lid, pressure is made from below upward, and in a short time the edge of the lens pushes the iris forward through the incision, and finally the lens presents and is very soon expelled.

If any soft cortical remains, it is better to remove it at once by a slight maneuver, before the iris recedes into the incision. If the iris does not retract spontaneously, it is very easily replaced with a spatula or with a spoon.

Then a drop of eserine is instilled. I then wet a small compress of cotton in the antiseptic and lay it over the closed lids and hold it in place by a small piece of isinglass plaster about half an inch wide, which extends from the forehead down to the cheek. I also close both eyes in a similar manner for a day or two after the operation. No bandage is applied, and the patient is thus left perfectly free to move his head as he will. I have found that dispensing with bandages has added to the comfort of the patient and not a little to the success of the operations.

The advantages of this method are that the eye can be inspected without any inconvenience to the patient. By simply detaching the plaster below, the compress of cotton can be lifted and the appearance of the lids examined. If there is no puffiness of the lids and no secretion, I generally do not inspect the eye for two or three days. At the end of that time it is well to examine the eye, and if the wound is thoroughly closed there will be little or no occasion for the use of atropine, but if the iris should show any tendency to reaction, a drop of atropine can be used. There is often a tendency to iritis the second or third day after the operation, but this can be readily controlled with atropine. If the iris should prolapse and become the source of much irritation, it is better to excise it at once. But in other cases the prolapse gives rise to very little disturbance, and in such cases it is better to wait, hoping that the process of cicatrization will render the operation unnecessary.

Dr. Knapp says, "If I review my cases, the opinion is forced upon me that the simple extraction is not only the best but also the safest method of removing cataract. The iris, spread out as a vellum interpositum between the corneal section and ciliary body, protects this, the most susceptible part of the eye, from the deleterious sub-

stance that may enter through the wound." Another consideration in my judgment is, that if any soft cortical should remain, it would cause less harm behind the iris than it would in a case where an iridectomy had been made and where the swelling lens substance could come directly in contact with the corneal incision. The trauma inflicted upon the iris by the expulsion of the lens in a smooth, uncomplicated, simple extraction is certainly less than in the Graefe extraction with iridectomy.

With a liberal corneal incision the lens comes out with surprising ease and ordinarily the iris replaces itself spontaneously. When it does not, it is easily replaced with a spatula or with the edge of the spoon. The latter has the advantage that it is somewhat wedge-shaped, and when introduced into the lips of the wound, opens them more widely and thus favors the prompt reduction of the prolapse.

After the escape of the lens, and while the iris is still out of the incision, it is better to remove all the soft cortical if possible. The slide maneuver should be continued until every piece is out. If the iris is allowed to go back into position, it is more difficult to cause its prolapse, as it no longer has the mass of the lens to force it out. In one of my cases there was a slight rent of the pupillary edge of the iris, but it caused no trouble.

ANKLE INJURY.

BY J. T. WOODS, M.D., TOLEDO, O.

The structure of the ankle joint, combined with its continual use, subjects it to great liability to injury. It serves exactly the province of a hinge, there being no lateral motion whatever. The osseous structures are so formed that they can be kept in place only by ulterior safeguards. No general statement, however, will serve so well in making its mechanics clear as a review of its

ANATOMY.

The tibia and fibula constituting the upper osseous elements of the joint are firmly bound side by side by the interosseous membrane and ligaments. The former is large and expanded at its lower extremity, furnishing the entire surface that rests on the astragalus beneath, while the fibula is relatively very small and situated on the outside of the great bone of the leg. As the tibia only rests on the astragalus, it is adapted to the upper surface of the latter bone by being somewhat hollowed from before backward, thus securing the antero-posterior, hinge-like movement. At the inner border of the tibial articular surface, a strong process projects downward about half an inch, the lower extremity of the fibula furnishing a like prolongation on the outside, but about three times as long as that of the tibia. Thus the upper articular surface of the joint is converted into a half mortise, the concave surface of the tibia securing the hinge

motion, while the process just described effectually prevents any lateral motion whatever, as they exactly fit the sides of the astragalus below. Of the astragalus it is only necessary to state that its articular surface is exactly fitted to the notch or mortise just described, extending on the sides and corresponding to the shape and extent of the malleolar processes. The portions of the bone thus brought into relation in the structure of the joint are covered by a dense layer on which the articular cartilage rests, which fits the surface for adherence of the synovial membrane. Next in importance to these solid elements of the structure are the ligaments by which they are permitted the necessary motion while held securely in place. These are technically classed as anterior, internal lateral and external lateral, there being none posteriorly.

ANTERIOR LIGAMENTS.

The anterior of these ligaments is described as "a broad, thin, membraneous layer attached above to the tibia and below to the margin of the astragalus, in front of the articular surface. It will be noticed that this ligament is both thin and short, just bridging over the point of bone contact in front.

INTERNAL LATERAL.

The internal lateral consists of a superficial and deep layer.

The superficial "is a strong, flat, triangular band, attached above to the apex and both anterior and posterior borders of the internal malleolus. From this point of attachment it extends downward, spreading out like a fan. The anterior fibres pass forward to be inserted into the scaphoid; the posterior fibres pass backward and outward to be attached to the astragalus; while the middle portion passes nearly directly downward to be inserted into the oscalsis."

"The deep layer consists of a short, thick and strong fasciculus, which, originating at the apex of the malleolus, is attached directly below to the inner surface of the astragalus immediately below the articular surface." Thus it is seen that internally the tibia is anchored in place by the external ligamentous fibres thrown forward to the scaphoid, which lies immediately in front of the anterior extremity of the astragalus, posteriorly by fibres to the inner surface of the astragalus, but in its central portion sends a stronger fasciculus to the inner surface of the oscalsis and finally a deeper fasciculus from the tip of the malleoli to the inner surface of the astragalus directly below the point of its origin. Thus the main strength is placed in the center, where the strain upon it in use must be most exacting.

EXTERNAL LATERAL.

The external ligament consists of three fasciculi, taking different directions and separated by distinct intervals. The anterior fasciculus, the shortest of the three, arising at the anterior margin of the apex of the external or fibular malleolus, takes direction downward and forward to be attached to the astragalus in front of its articular facet. The posterior fasciculus is the most deeply seated, and passes from the inner and back part of the malleolus to the astragalus immediately behind its external malleolar facet. The middle fasciculus, the longest of the three, is a narrow, rounded cord extending from the apex of the fibular malleolus downward and slightly backward to the middle of the outward side of the oscalsis. Of these fasciculi it will be noticed that the anterior and posterior exactly counteract each other, while the middle is by far the strongest as well as the longest, and attached to the malleolar apex above and almost directly below to the oscalsis.

Studied as a whole, it is apparent that the entire ligamentous structure is weak save at the center, and there the origin is at the malleolar apex and attached directly below. The mechanical consequence is that great strength is secured at this important central point with facility of antero-posterior motion, but associated with a weakness in the limited space of origin, the malleolar apices affording small surface for the adherence, and consequent ease of separation either with or without severance of a shell of bone beneath.

The synovial membrane overlies the articular surface of the tibia and fibula, is then reflected over the inside of the ligaments just described, extends downward between the malleoli and astragalus, and is completed by covering the surface of the astragalus. A point which I regard as worth noting is that the inner surface of the ligaments is adherent to the synovial membrane. Their injury, as in case of complete laceration, can scarcely occur without a corresponding damage to the synovial membrane itself. The mechanism is completed by the annular ligament, through which passes in sheathes the tibialis anticus, extensor proprius polices, extensor longus digitorum and peroneus tertius — over the middle fasciculus of the external lateral ligament the peroneus longus and brevis, while the internal lateral has lying on its surface the flexor longus polices and tibialas posticus. These tendons are no part of the joint proper, but when their muscles are put into action, the tendons being held down by the annular ligament are made tense at the same time that the joint is moved and the ligaments put to their uses, whether it be slight or severe. There are few things more tedious than anatomical recitals, but the affliction in this case prepares us to understand that the adjustment of parts in this joint is so compact that if any be impaired

a corresponding defect in action must inevitably follow. It also makes apparent from the form and situation of the lateral ligamentous cords, that slight causes acting when the muscles of the leg are relaxed, and hence their tendons failing to give to these ligaments external support, may materially aid in causing that form of dislocation in which the foot and ankle roll or turn, especially inward.

Of this injury there is practically every grade, from the slightest over-tension on the lateral cord, to that of its complete rupture, with or without fibular fracture or splitting of the tibial articular extremity. But I wish to confine myself to the slightest forms, the sprain or partial rotation of the ankle, known professionally as partial luxation and popularly as twist of the foot. Whether this partial luxation is inward or outward, the pathological principles are identical, and as the internal form is most common, it is better to consider it alone. If we attempt to roll the astragalus inward in its mortise-like socket, the pivotal point of movement must be on the internal border, and the outer move on the arc of a circle. It is, however, so firmly held between the malleoli that to roll it is impossible without the articular surface being raised from its place and the whole bone partly lifted out. This involves great tension of the cord—like fasciculus of the fibular or outer lateral ligament, and secondly, tension of its short fellow fasciculi or ligaments before and behind it. Little disturbance will occur on the inner or pivotal border, but the external edge is at the farther end of the radius, bringing the violence in full force on the three lateral fasciculi, and as they are normally tense, slight stretching cannot fail to produce pathological conditions.

It must not be forgotten that the structural strength of these tendons is as variable, in different individuals, as are other parts of the body, and what is equally important, tendency to recuperation varies in

a most unaccountable manner. The question then becomes one of degree of force, and structural or other constitutional peculiarities of the individual. The force determines amount of rotation, the rotation the degree of ligamentous tension, and it may be so slight as to cause no severance of fibres in its mass. The fibres being severely stretched, without rupture, a change in intimate structural condition must be produced quite sufficient to give rise to tenderness that may be quite persistent, even in the mildest form of a sprain. Assuming an undemonstrable structural change to be the true pathology of the minor ailment, a greater degree of rotation must cause severance of fibres, and still greater force increasing the number, the result being sprain of a relatively severe grade. The pathological results keeping pace with the force applied, complete rupture finally occurs, either in its body or it is torn from the osseous attachment, either with or without a shell of bone. From these structural results there must follow active irritation or inflammation, more or less acute, depending upon the degree of injury and very largely on constitutional conditions and tendencies of the sufferer. Ligamentous tissue in a state of inflammation becomes injected with blood and its mass relatively soft and yielding. The acute stage of inflammation having passed, and with it the tenderness, an attempt at use can only result in stretching the softened tissue, which being repeated by the patient, spurred on by the mistaken fear of stiffening of the joint, the result is final recovery with ligament longer than it was originally, and a consequent defect in the mechanism, shown in a permanent tendency to rotation of the joint from trivial causes.

The complete severance of the ligament in its body would almost certainly result in union of less capacity, or, if the ends had been some distance apart, the

intervention of new tissue, in which case it must of necessity be longer than natural and a defect occur similar to that just indicated. Should severance occur at either point of union with bone, especially the upper, re-attachment at the exact point of severance could scarcely occur, and from this cause a defect in the joint must follow. It is always possible that a shell of bone may be detached, which would, of course, materially complicate the case. But these severe forms of injury are not necessary to the development of a serious trouble. In some constitutions, and especially if the patient will persist in the use of the part, the rupture of a small fibre is quite sufficient to prove the center of an inflammatory action, which, extending to adjacent parts, would involve the whole mass, and thus a slight become converted into a great ailment, with all the consequences that attach to a greater original laceration.

I know no injury in which both judicious direction and treatment are more likely to be disregarded. This, however, should not deter the professional attendant from strongly urging the proper measures for cure, for thus the responsibility is placed where it belongs. He can rest assured that the cases, even of slight injury, in which the constitutional qualities of the patient are such that inflammatory action will not find ready play, are few indeed, only enough to afford the hopeful and impatient sufferer an apology for reckless disobedience. But beyond these there are other more protracted and damaging possibilities. Between the minimum and maximum there are many grades and forms, and while ordinary experience is circumscribed within comparatively narrow limits, it is always best that he who has charge of a case should at least know what difficulties and dangers may be encountered. Of course these consequences will vary, but a general idea may be better derived from *actual experience*

than a general statement, as the former, if carefully stated, has the merit of being copied from the book of life.

In the instance I have decided to relate, the sufferer was the accomplished daughter of an eminent surgeon and physician in eastern Ohio, and of course her father's patient. During her illness I saw the case repeatedly, in consultation, and thus obtained an accurate account of all that pertained to it.

Of mature womanhood, in perfect health, robust both in form and power, without constitutional taint or damage, either hereditary or acquired, and accustomed to the in- and outdoor life of a country village, the young lady, on the seventh day of November, 1882, slipped slightly on a wet board, the right foot turning inward, she becoming instantly unconscious from pain. The deviation of the foot was immediately corrected on the weight of the body being removed from it, slipping into place of its own accord, accompanied with the peculiar sound indicating the replacement of a dislocated bone in its socket. A careful examination showed that there was no fracture, and as to the degree of ligamentous injury, the usual uncertainty existed. No discoloration of the tissue followed the dislocation, and the only swelling or puffiness was situated immediately forward of and below the outer malleolus. The pain was so slight that it was not deemed imprudent to walk around the room moderately and with care.

The satisfactory condition continued about a week, when a gnawing or tingling sensation occurred at the site of the puffiness before noted, accompanied by such feeling of soreness that the use of a crutch was resorted to, but chiefly as a safeguard in management.

During the first few weeks the patient rode out in a buggy a couple of times. The roads were smooth, but the jarring caused discomfort in the limb, so driving was

abandoned. During the last week of 1882, the tenderness had so much increased as to require the use of the second crutch, and from this time the foot was not touched to the floor until the first week of February, 1883. At that time very little ill feeling was experienced when the parts were kept absolutely quiet; but the least motion of the joint developed a most exquisite hurting that did not seem to be pain proper. Up to this time the treatment had consisted of hot applications, with the addition of liniments of various kinds. This was then in the main abandoned for the use of splints, which gave such relief that by the latter part of the month it seemed that recovery had taken place. The splints were removed, a bandage applied snugly, the crutches laid aside and the limb used carefully in walking for the next six weeks.

Early in April some pain occurred in the limb, but the patient did not feel sufficiently concerned to abandon walking without support. At this time the performing of some routine duties required her to go to the woodshed, when for a brief time she stood on a round stick which pressed into the hollow of her foot. On the next day she stood on a step-ladder, the bottom of her foot resting on the narrow step. A slight discomfort was experienced on the first instance, this intensified on the second, and gradually increased so that within two days she was compelled to again resort to crutches and in a very short time was forced to bed, when absolute rest gave such results that in a day or two she would try to walk and could do so at the time with little pain, but in a few hours would suffer exquisite torture. All efforts at use of the limb were then abandoned, the splints applied and the patient occupied her bed. The swelling was not very great, but the most intense hyperæsthesia existed in all parts about the ankle. Absolute rest brought such rapid improvement, however, that on the fourth of July she ventured

on a carriage drive of a few miles, but the jarring incident to it, although the parts were held as firmly as possible with splints, resulted in increase of discomfort and within a few days to intense suffering. The leg became involved in the pain, which was somewhat paroxysmal but always increased by motion, or the hanging of the limb downward. Three of the toes were drawn up at first when the pain was so severe and finally for some time remained fixed, the tendons above rising from the surface like tense cords, but as final improvement occurred they passed into their normal position. Late in the fall of 1883 she experienced a prickling sensation in the lower part of the back when lying on it, and slight tenderness on pressure.

Pain had extended to the opposite leg and thigh. During the holidays of 1883, a blister was applied to the region of spinal tenderness and the counter-irritation sustained for more than a year by the application of croton-oil. The immediate effects of the blister were marked, as the pain was suddenly so far relieved that for the first time in months the foot could be placed on the floor. Directly on the action of the blister the disagreeable tingling sensation and muscular quivering of the foot extended up the thigh, so as to seem to require splint support there rather than below, from which point the discomfort correspondingly withdrew.

Having by this time learned that long-continued discretion was the most comfortable if not the better part of valor, the young lady made no more rash experiments. The year of 1884 was spent on the bed, alternated with crutches cautiously used, the splint supports being continuously applied, together with spinal counter-irritation, the improvement progressing almost imperceptibly. Early in 1885 one crutch was dispensed with and at first a cane substituted. This was in due time dropped, and about the middle of the

following October the last crutch was laid aside, save for special occasions, the patient watching her power as became an invalid. A singular tenderness persisted for a long time in the sole of the foot, the part pressed upon in standing for a brief time on the stick of wood and the step of the ladder, so that she could not wear a shoe with a steel spring or shank in the sole, because of the pain produced by it.

This case seems to me to be in several particulars thoroughly illustrative. The degree of injury and also its cause are such as are quite common. The immediate consequence was such as to warrant belief in rapid repair, there being little soreness, no discoloration, and trifling swelling. The limb admitted of tolerable use for about six weeks, during which time the patient did some duty and made neighborly calls. No symptom appeared warranting a more than trifling injury to the ligamentous tissue, although theoretically, it might be assumed that such was the case; yet she was on crutches over three years. The frequent subsidence of the most severe symptoms after absolute rest, their prompt return after movement of the joint, demonstrated the presence of an inflammatory focus, the tendency being toward recovery if only permitted to do so, sufficient time being allowed. The involuntary muscular tremor was exceedingly harassing and only controlled by splints and bandages. Reflex action was not only shown in this, but in the tonic spasm of the flexor digitorum, by which three or four of the toes were firmly drawn up to their utmost capacity.

That this ankle injury, through irritation of the sensory nerves, produced a morbid condition of the spinal nerve center, is shown both in the existence of morbid nerve sensibility there and the extension of like morbid nerve sensations to the left leg and thigh like those existing in

the injured limb. In addition to this, the treatment by its prompt relief not only at first, but repeatedly afterwards, when counter-irritation had been allowed to become too slight, in each instance relief promptly following, showed beyond doubt that the morbid point had been largely transferred from the ankle to the spine, and that in the later stage of the trouble the phenomena in the limb were so largely due to influences then originating in the spinal nerve center, that appropriate measures for the removal of this morbid condition were the only means that seemed to have any decided influence save the benefit derived from quiet. Considering herself now well, the fact is that she is only partially so. Being able to use the limb in walking is satisfactory, but defects still exist requiring continual care, with reasonable expectation that the weakness of the parts will be permanent.

TREATMENT.

In this, as in other ailments, treatment depends much on circumstances and the judgment of the surgeon. Should he be present or immediately summoned, it would be wise in him to remember that all ankle sprains are both treacherous and dangerous, that the greater includes the less, and that if he pursues a course of apparently excess of care he will make the fewest possible mistakes. He will be likely to find the partial dislocation instantaneously reduced, with pain and shock gradually disappearing. If swelling has not appeared there would not seem to be any indication for treatment, in which circumstance he will do well to so manage the matter that none may arise.

The most common-sense measure is to secure non-movement of the joint. Manipulation should be gentle and but little of it, and trial efforts at walking absolutely prohibited. He will, however, be almost sure to find some swelling on the anterior aspect of the malleolus, with

tenderness on pressure at that and other points, an indication absolutely sure as to the existence of an injury demanding the best efforts both of patient and surgeon. The medical adviser not being present, he will not usually be called at once, and in the meantime the patient will manipulate and move the joint, will have tried to walk on it, and possibly be delighted to find that this can be done, liniments and other remedies known by the neighbors to be infallible will have been resorted to, in defiance of all of which swelling will either linger or increase, discoloration of the parts occur, and, if pain had subsided, will return without or with apparent cause, when all concerned at last deem it best to place the responsibility on the professional man.

The indications are now perfectly defined, and the aim of treatment entirely clear. The existing inflammation must be mastered by whatever measures necessary and the best means afforded for permanent recovery, however long it may require. There is present an inflammation in the joint structure: this is to be subdued by measures appropriate to its degree of intensity, and somewhat dependent on the stage of the ailment and constitution of the patient.

In the more aggravated conditions the abstraction of blood by free leeching will render signal aid. This may be resorted to at any stage of the treatment, its use resting on the judgment of the practitioner. If there be present the unaccountable and torturing tremor of the limb that sometimes occurs, whatever other treatment may be adopted, nothing will afford relief but the thickly padded splint support, with the use of which the treatment is to be conducted in the best possible form. It is only in rare cases that a degree of inflammation requiring resort to leeches will be met with, and perhaps quite as rarely will be the tremor just indicated.

The condition usually found will be manageable by simpler means. In every phase and stage absolute quietude of the joint is indispensable. As long as the least swelling exists, as long as the least tenderness is found about the joint by gentle pressure, just so long is it unfit for the least use, and whatever else may be resorted to, be the period long or short, absolute immovability of the parts must be maintained. When the eye is inflamed we dare not use it; when the ankle is inflamed the same law holds as firmly. Danger of a stiff joint lies in increasing the inflammation and delaying the recovery. Non-use until the last vestige of swelling and tenderness has disappeared is a guarantee of the best joint condition that is attainable. Anchylosis as a result of non-use until the period above indicated is both a myth and fraud. It does not occur. If then the inflammation is sufficient to demand leeching, let it be done, and then proceed to the use of hot water and securing joint immobility. Both these measures are to be secured at the same time, the immobility by means that will be comfortable to the patient and admit of free hot bathing. The most satisfactory means I have found is to take a piece of muslin about a yard square and fold it lengthwise upon itself so as to form a pad one yard long and three inches wide. Lay the center of this on the bottom of the foot and carry the ends along the sides of the leg. These ends being drawn snugly up so as to hold the foot and ankle firmly as in a stirrup, apply over it a roller bandage, making numerous figure of eight turns about the ankle, foot and leg, or in lieu of this stirrup a flannel bandage may be applied about the joint and over this the common roller. To secure firmness, the same attention must be paid to the figure of eight turns just referred to. The ankle may be covered with finely picked oakum in lieu of the flannel bandage.

Whether these last measures are resorted to or not,

the stirrup-pad of the first method will be found to give desired security in any case in which the reflex trembling does not occur. When this is present a splint must be placed over the whole, and this must be of a material that will withstand the use of water. Wire gauze is the best, some form of foot-piece being attached. Thus prepared, the limb is placed in a vessel of water as warm as can be borne and of sufficient depth to come well up toward the patient's knee. This bath should be continued for at least half an hour, an attendant adding hot water at intervals, so as to maintain the temperature at the highest point of endurance. When this is removed the excess of water is quickly squeezed off, a dry flannel wrapped about it, and over the whole a piece of rubber tissue, the size of which is sufficient to cover the limb from immediately below the knee to a point beyond the toes. This is made to prevent evaporation by tying with cords or application of bandage.

By this means heat and moisture are maintained at the point desired for one or more hours, when the removal of the rubber and flannel makes all ready for repetition of the bath. In this way the continuous benefits of hot water bathing are secured without handling the limb or the least jarring of the joint, and may be continued for days, if desired, without change of dressing. Of course the dressing may be removed at any time and for any purpose, but it is best to allow it to remain until we are quite sure that the benefits of hot bathing have been secured, when it should be taken off and the pad-stirrup adjusted as first described. Should this not prove to secure sufficient quietness, a longer splint, as the moulded felt, may be placed over it. Should the inflammatory state again occur, the above treatment should be immediately resorted to, as there are no other means of so readily and rapidly overcoming that condition in the joint.

The acute is sometimes followed by a subacute or chronic inflammation that is to the last degree vexatious both to patient and surgeon, and beside that, is unpromising as to results. In one case associated with hyperæsthesia, after failure of all other measures, the patient was placed in bed, his foot laid on a pillow covered with an oil-cloth so folded as to carry fluids into a vessel beside the bed. From a vessel, by aid of a rubber tube and a small stop-cock with which to regulate the flow, warm water was made to run onto a mass of oakum laid over the swollen joint. This was continued for three weeks, with benefit observable from day to day and a final happy result. In another the ankle and adjacent parts were covered with a poultice of common blue clay. The material was made into proper consistency with water, laid on thickly, and the whole enveloped in rubber tissue to prevent rapid evaporation. It is to me a curious circumstance, but fact it is, that the tenderness and heat were largely modified, the application giving the patient exceptional satisfaction.

In the chronic condition, I have had excellent results from the application of a counter-irritating liniment made by taking the desired quantity of oil of cedar, placing it in an open vessel, and dropping into it iodine, crystal by crystal, until completely saturated. This must be allowed to cool before bottling, and is applied once, twice, or thrice a day, until slight cracks occur on the outside. Its use is then to be governed by the comfort of the patient, but applied as often as can be borne. It is applied by brushing over the surface. This preparation has a penetrating property that I have not found in any other form of the drug, and has acted very satisfactorily in my hands. Blisters may be necessary, and I can imagine a case in which the actual cautery would be in place, but have not yet had experience. But when the inflamma-

tory state is really mastered, the patient has only commenced to get well. There is yet a long period of probation. As long as tenderness is discoverable by finger pressure, the limb is unfit for the least use, even for the trial test that the patient is sure to make. Crutches are a help, but soon become odious. The limb is sure to be put into use before it should be. The stirrup bandage is somewhat bungling, and at a proper time may be substituted by a simple roller bandage snugly applied with many figure eight ankle turns.

When the time arrives that the use test is to be made, at the very best there will be found to be a tendency to turning inward, accompanied by pain, the condition being that of weakness of the joint structure about the external malleolus. I have overcome this by taking a piece of rubber adhesive plaster two inches wide and fifteen inches long, and splitting the initial end about three inches. At a proper distance from this end it is laid on the sole of the foot and the short tails brought up smoothly and made to adhere about the internal malleolus. The external malleolus being neatly padded about with cotton batting, the foot is held firmly outward, the long end of the adhesive plaster drawn taut, and its upper end made to adhere on the outer aspect of the leg. The patient presses it to secure its adherence while a roller bandage is applied from the toes to the upper extremity. This substitutes the outer ligamentous structure and affords not only security against injury, but the utmost confidence and comfort to the patient, and should be continued for a long time. An ankle support is made by the St. Louis Anklet Company, that, fitting and lacing neatly, serves excellently when the ordinary shoe and stocking are to be worn, and is especially valuable to those whose best recovery leaves them with a weak and unreliable member. But during all the

tedious and perplexing local treatment, the constitutional condition must not be overlooked. There is liable to be associated anæmia, debility, or rheumatism, which, with many other conditions, may be factors in delaying recovery, and that require the most persistent treatment in conjunction with that described. With all and any measures, it behooves the medical attendant to impress both patient and friends that time is a requisite; that faith, patience and endurance are a necessity, and that in a case of any considerable severity of symptoms, reckless efforts at use are sure to result disastrously.

LARYNGEAL PHTHISIS.

BY A. B. THRASHER, M.A., M.D., CINCINNATI, O.

Laryngeal phthisis, tuberculous laryngitis and throat consumption are names given to this most fatal malady. It is recognized even by the laity as a most rapid form of consumption.

Etiology.—The disease is probably generally secondary to a like condition of the lungs. This was formerly thought to be always the case, but numerous examples have now proven that tuberculous disease may be present in the larynx when there is no pulmonary tuberculosis. Demme was the first to prove this proposition. In his case an autopsy showed tubercular ulcerations of larynx in a child dying of tubercular meningitis with no other organs affected with tubercular disease. Ziehl has also reported a case where he had made a tracheotomy for laryngeal stenosis. The secretions, as expectorated through the tracheal canula, were free from tubercular bacilli, which was not the case with those coming from the laryngeal ulcerations. Solis-Cohen reports a case of a young man presenting the laryngoscopic appearance of tubercular disease of larynx, having no objective evidence of an involvement of lungs. In this case the patient recovered, and Dr. Cohen regards it as a case of recovery from primary tubercular laryngitis. Of course I recognize the difficulty of saying in any given case of laryngeal trouble that there is not present a small amount of pulmonary disease. We have all seen cases in which con-

siderable tubercular affection of lungs has given rise to little or no objective symptoms, and our physical examinations are not always conclusive proof against the presence of pulmonary affection. Then I would state that the weight of evidence seems to favor the primary location of tubercle in the larynx, although the rule is that there is accompanying or antecedent phthisis pulmonum.

As to the part played by Koch's tubercular bacillus as a causative factor, I shall have but little to say, as it would probably perform the same office here as in any other organ or part of the body. The bacilli are usually abundant in these cases, but the severity of the affection is in no way proportionate to the number of tubercular bacilli present. This would seem to indicate that the bacilli might accompany rather than cause tubercle, the tubercular tissue being a suitable nidus for the growth of these micro-organisms.

That tubercle invades the larynx, because of a pre-existing inflammation of the laryngeal mucosa, excited by cough or from any other cause, is a theory held by many. Louis long ago advanced the theory that the frequent affection of the larynx was due to the irritating properties of the expectoration from the diseased lungs. Many of the followers of Koch have adopted this theory, with the annex that the "irritating property" is the tubercular bacillus.

Heinze's pathological researches would, however, point in another direction, as he has demonstrated that the destructive process begins beneath and not on the surface. Lennox Browne, recognizing this fact, suggested that the bacilli might be conveyed to the larynx by the general circulation rather than by the cast-off secretions; but this brings us to the original proposition of why to the larynx rather than to any other organ of the body? Of course

if the disease is produced by bacilli, and these bacilli gain entrance to the body by means of the inspired air, then nothing is more simple than the lodgment of some of these germs on the surface of larynx and the consequent laryngeal infection. But if such is the case, John N. McKensie has well asked the question, Why do we not find the affection more frequently in the nares, where the air and its load of bacilli first come in contact with the mucous membrane? And then again, Why does the pathological process originate beneath rather than on the surface?

At last, then, we must fall back, as does Morel Mackenzie, on the doctrine of the *locus minoris resistentiæ* as the reason why the larynx is attacked in preference to the kidney or the intestine.

The over-use of the voice may cause weakness of the larynx. That this is a potent factor is proven by the fact that so many voice users are thus affected, and that in the age and sex in which the voice is most abused do we find the largest proportion of laryngeal complications among phthisical patients. Especially does the over-use of the voice tend to this disease when the patient is in a bad atmosphere or subjected to unhygienic surroundings. The lawyer pleading in the foul air of a court-room, the singer in the vitiated air of a concert hall, the minister in a poorly ventilated church, would be subject to this malady much sooner than the cow-boy yelling on the back of a broncho in the pure air of the plains.

Mouth breathing caused by nasal stenosis is one of the most frequent causes of simple laryngitis, and, in a case predisposed to tubercle or surrounded by bad hygienic conditions, might prove to be the causal factor. In rather a large proportion of my cases of tuberculous laryngitis is there a history of nasal disease, and hypertrophies of the turbinates are quite common in the early

stages. Of course, the opinion promulgated by advertising doctors and quite prevalent among the laity, that "nasal catarrh" is liable to extend downward to the lungs, is not true. But it is true that when the intranasal disease has given rise to obstruction of breathing through the nose, the irritation produced by mouth breathing may be a powerful element in the production of tuberculous laryngitis or even pulmonary tuberculosis.

Pathology.—In the first stages of this disease we usually find an anæmic mucosa. There are, however, exceptional cases in which there is hyperæmia. Dr. Cohen has pointed out that in these latter cases there is present an acute tubercular process. After the stage of anæmia, which is very variable in point of time, comes the tumefaction or deep infiltration of the tissues, followed by ulceration and the breaking down process.

Symptoms.—Cough is of course a prominent symptom. As the disease progresses and the ulcerations become extensive, cough becomes more and more painful. On account of the pain, cough is restrained as much as possible.

The voice is early changed on account of the weakness of the intra-laryngeal muscles, and because of the obstruction to movement by reason of œdema and deep infiltration. This is at times the symptom which causes the patient to consult the physician. Of course, in cases of great tumefaction or extensive ulceration, complete aphonia exists, and this is the usual condition in the later stages of the disease.

Respiration is not at first affected by the laryngeal trouble; but when the cartilages become implicated or much œdema present, then marked dyspnœa, even to the point of suffocation, may exist.

Deglutition is in the ulcerative stage generally seriously interfered with. The dysphagia is from two causes,

viz.: the infiltration obstructs the perfect closure of the glottis, thus allowing liquids to trickle into the larynx; and, the mechanical irritation of the passage of the bolus of food. This symptom is most distressing on account of the pain produced and by reason of depriving the patient of proper or sufficient nourishment.

The pain is transitory in character, ceasing soon after the removal of the causal irritation. The temperature is elevated and there is derangement of the digestive, circulatory and nervous systems such as usually accompanies pulmonary tuberculosis. The appearance of the larynx in the laryngeal mirror not infrequently at once settles the diagnosis. The grayish-white color of the mucous membrane first strikes the beholder. There may be localized hyperæmic patches, and at times even the entire surface may be reddened, but the rule is anæmia of the whole pharyngeal and laryngeal mucosa.

Infiltration is seen over the posterior extremity of the eryepiglottic folds, on the vocal bands and the epiglottis. The tumefaction over the arytenoids not unfrequently presents a characteristic picture of a pyriform swelling, pale and opaque, over one or both cartilages. Sometimes the free border of a vocal band is thickened in a like manner, or both cords may be thus affected. The under surface of the epiglottis is usually implicated. The ulcerations are usually multiple, small, with ragged edges, superficial, surrounded by a slight zone of hyperæmia. They are found on the free borders of the vocal bands, the epiglottis or eryepiglottic folds. Several may coalesce, forming a large ulcer, but still having the ragged edges eaten out from beneath the surface. The secretion is usually free, but not unfrequently viscid, tenacious, adhering obstinately to the ulcerated or diseased surface. The general symptoms are not unlike those of pulmonary

tuberculosis, which, as I have before remarked, is usually an accompanying disease.

Diagnosis.—The diagnosis is generally easily made when the disease is far advanced, and there are the usual pulmonary symptoms. When, however, there are no objective evidences of pulmonary disease, then there may arise some question as to the nature of the affection. Lupus, cancer and syphilis are about the only diseases likely to be confounded with tubercle in the later stages. When syphilis attacks a tubercular subject, then there may be a temporary confusion in diagnosis.

There is great difference of opinion among laryngologists as to the existence of a characteristic tuberculous ulcer. Yet I am inclined to side with Lennox Browne in thinking that the tuberculous ulcer presents in the laryngeal mirror a picture not apt to be mistaken by an experienced laryngoscopist for any other. Several small ulcers appearing on the under surface of an anæmic epiglottis, having nibbled edges, accompanied by tumefaction over the arytenoid cartilages: this could mean nothing else than tubercle. But when there has been extensive destruction of tissue, then other factors may be taken into consideration in making up the diagnosis.

Tubercular disease is, as a rule, very slow in its progress, cancerous not so much so, and syphilis rapid. In cancer there is constant pain, irrespective of deglutition or cough; in tubercle, pain is only pronounced when the parts have been irritated. In cancer we have a single ulcer or an elevated angry tumor, usually situated on the ventricular band, surrounded by highly inflamed tissues; in tubercle there are several small ulcers on an anæmic membrane.

In syphilis the buccal surface of the epiglottis is attacked; in tubercle, the under surface. In syphilis there is enlargement of the anterior and posterior cervical

glands; these may not be affected in tubercle, especially the posterior cervical. When in doubt as to the presence of syphilis, one week's anti-syphilitic treatment will establish the diagnosis; if syphilis, the disease will grow better; if tubercle, worse.

Lupus of the larynx is an exceedingly rare disease. It is generally accompanied by lupus elsewhere. There is, as a rule, a greater proliferation of new tissue than in tubercle. I have had the question of differential diagnosis to arise in my practice but once, and then one of the most distinguished laryngoscopists in this country had diagnosticated lupus. The final involvement of the lungs and the rapid death of the patient confirmed the diagnosis of tubercle.

Treatment.—The constitutional treatment of laryngeal phthisis does not differ from that of phthisis pulmonum. Since it is essentially a disease of mal-nutrition, care must be taken to provide good food and fresh air. Where money is no object, a suitable climate must be selected. This usually means a rare, dry air; as, for example, the plateau of Colorado or New Mexico. Some cases will do better on the sea or in Northern Africa or Australia. The climate must be selected for the particular patient, as all cases should not be sent indiscriminately to the same place.

Proper exercise in breathing I consider an important adjunct to constitutional treatment. These exercises should preferably be taken on arising in the morning and before retiring in the evening. A morning cold sponge bath is also useful in the majority of cases. Horseback or bicycle riding several hours daily, and sleeping room well ventilated, living rooms properly heated with stoves or steam heat: these are some of the many things conducive to the general welfare of our patient.

Locally, our treatment is addressed to the healing of the

ulcerations and to the relief of pain. Do tuberculous ulcers ever heal? The answer is as positive as the diagnosis will warrant in the affirmative. The lactic acid treatment has given good results and is applied as follows: The floor of the ulcer is first thoroughly scraped, and then the lactic acid is rubbed in by means of a cotton applicator. This excites considerable irritation, which, however, soon subsides and the ulcer begins to heal like an ordinary sore. I cannot say that lactic acid has acted any better for me than has chromic acid or tri-chlor-acetic acid. The galvano-cautery applied at a red heat to the ulcerated surface has, in my hands, answered better than any of the acids. There is less after pain and the slough from the cautery is cast off more rapidly and with less inflammation. Of course the application of any of these severe agents is preceded by thoroughly cocainizing the part to be treated. Massei of Naples reports encouraging success by using the bichloride of mercury in strength of 1-2,000 daily to larynx.

However doubtful we may be as to the curative value of local treatment, there are no differences of opinion as to the effect in relief from pain.

The application of a 10 per cent. solution of cocaine to the larynx will frequently allow the patient to eat a good meal. But the effect of cocaine is exceedingly transitory. One-quarter of a grain of morphia in five grains of milk sugar blown into the larynx relieves dysphagia in some cases. Of course the constitutional effect of the drug is probably as good as the local. A 10 to 20 per cent. solution of menthol, applied by means of a cotton applicator or in a vaseline spray, wonderfully relieves pain and seems to exercise a good effect on the course of the disease. Brushing over the ulcers with a 25 per cent. solution of nitrate of silver will, in some cases, so

protect the surface as to allow of eating solid food when it was before impossible because of pain.

Dr. Tauber reports the happiest results from the use of a strong solution of carbolic acid applied to the ulcerated surface. The local anæsthesia thus produced lasts during the day, so that daily applications enable the patient to swallow with comparative ease. In my own practice this remedy has answered admirably well in some cases. Insufflations of iodoform or a spray of a saturated solution of iodoform in ether have done well at times, but the odor of the drug is so disagreeable that most patients prefer some other equally effective treatment. The greatest relief for patients in the last stages of phthisis, with intense dysphagia, has been found in my experience in the inhalation of a spray of vaseline in which has been dissolved 10 per cent. of menthol, 2 per cent. to 5 per cent. each of morphia and cocaine.

This mixture is warmed and sprayed during inhalation into the larynx one-quarter of an hour before eating, and as frequently as there is severe pain from coughing. The patient or an attendant can easily be instructed to manipulate the spray, and the last days of the sufferer, instead of a state of excruciating torment, will be comparatively painless.

A FEW OBSERVATIONS ON THE ETIOLOGY, PROGNOSIS AND CURE OF INCIPIENT CATARACT WITHOUT OPERATIVE INTERFERENCE.

BY A. R. BAKER, M.D., CLEVELAND, O.

OBSERVATION I.

I was consulted by Mrs. S., aged forty-three, in the spring of 1884, on account of loss of sight. I found that she had a cataract of the left eye almost mature, *i. e.*, she could not count fingers and no red reflex could be seen from the fundus with the ophthalmoscope; with the right eye she could only count fingers with difficulty at six inches. I could get a slight reflex from the fundus, but was unable to see any of the retinal vessels.

The history of the case led me to suspect diabetes, and upon examining the urine, I found large quantities of sugar. I prescribed tablets of iron, arsenic and strychnine and gave the patient a diet list, in which all articles of food not marked were positively forbidden. The directions were followed very faithfully. The sugar diminished in quantity very rapidly and at times disappeared entirely; but what was most remarkable was the immediate improvement in vision. In the course of a few weeks she was able to read ordinary newspaper print, and with the ophthalmoscope I could see the retinal vessels distinctly in either eye.

My note-book contains a memorandum, April 25, 1885, stating that her vision at that date in left eye was $\frac{20}{70}$ (S.) and right eye $\frac{20}{60}$ (S.). For a period of over four

years the patient was under my observation. Almost all the time there was a little sugar in the urine; at times, after some indiscretion in diet or exposure to cold, there would be an increase in the amount of sugar excreted, and almost simultaneously a decrease in the visual acuteness.

In September, 1888, Mrs. S. was called into court as a witness in a case which involved the title of her home; was kept on the stand all day; on the way home she was caught in a shower, had a chill that night and died of diabetic coma in less than a week.

Remarks.—Similar cases are not unknown to ophthalmological literature. Dr. Seegen reports two cases in his work on "Diabetes Mellitus." One case was that of a man aged thirty-nine, who in July, 1863, noticed that his sight began to fail; this was about six months after the first appearance of diabetes. The lenses were cataractous. Under treatment at Carlsbad, the lenses cleared; the quantity of urine was reduced about one-half, although the sugar remained about the same. In the spring of 1865, the lenses again became opaque.

The other case was that of a woman aged fifty-five, who was first seen in the autumn of 1867, soon after which the sight began to fail. She was treated for diabetes in February, 1868, and while under treatment the lenses became clear again.

Dr. Tannahill also reports a case of a coal miner who was seen while in prison. He had suffered from diabetes for eleven months. Both lenses were opaque—the left more than the right. He was put on the ordinary diabetic diet, and was given two grains of opium daily. While under treatment his sight began to improve; the opaque lenses gradually cleared, and upon inspection, when he was discharged from the prison, no trace of the cataract remained. In 1885 Mr. Nettleship reported a similar case to the London Ophthalmological Society.

OBSERVATION II.

Mr. O., aged sixty-two, mature cataract of right eye; immature cataract of left; vision (S.) $\frac{20}{200}$; operation of linear extraction performed on right eye in October of 1883; vision after operation, $\frac{20}{30}$. As I usually examine the urine as a routine practice in all cataract cases, I did so in this, and found quite a large amount of albumen. There was a slight hypertrophy of the heart, but no valvular disease found. Dietetic and medicinal treatment for the albuminuria was instituted, with quite satisfactory results. At the end of a year, I was informed by the patient by letter, that his sight in left eye had improved very much, and that his spectacles were unsatisfactory. I saw the case soon afterward, and found that his vision had improved to $\frac{20}{50}$ (S.) in this, the unoperated eye; and that he had discarded the cataract spectacles and was using his old ones, with which he claimed to see better. He continued to use a pair of +2.50 D. lenses which I gave him until about one year ago (five years), when his sight began to fail rapidly in the left eye, and he returned to the use of the cataract lenses. About the same time, there was a decided increase in the amount of albumen in the urine, and at present, the old gentleman is suffering from œdema of the feet and legs and other serious results of kidney disease.

Remarks.—I have found albumen in the urine of a large percentage of my cataract cases, usually not in large quantities, and in most cases unsuspected by the patient or family physician. But casts and hypertrophy of the heart have usually demonstrated the existence of nephritis. Deutschman has made the same observation, and believes that the coincidence of chronic Bright's disease and cataract is not accidental, and that "we must recognize a nephritic cataract just as we recognize a diabetic cataract, the cause in both cases being constitutional."

I am not aware that any cases are on record in which nephritic cataracts entirely disappeared; but it has been the observation of everyone that the progress of a cataract is very uncertain, at times progressing rapidly, at other times slowly, and frequently remaining stationary for months or years. Is it not quite possible that if the general health was carefully interrogated, some other than *senile changes* might be found to explain the origin of cataract and enable us to give a prognosis more favorable to the patient than inevitable blindness?

OBSERVATION III.

Mr. C., in 1884, consulted an oculist for failing vision, whose ability to diagnose incipient cataract I could not doubt. A preliminary iridectomy was made prior to the cataract extraction, which, it was said, would be made in the course of a few months at most.

Mr. C. has now waited five years for this cataract to mature, and now, much to his gratification, there is no cataract to be seen or evidence that there ever has been one.

OBSERVATION IV.

Mr. O. D., in 1871, consulted Dr. C. R. Agnew for failing vision. Dr. Agnew diagnosed incipient cataract of both eyes; also found quite a high degree of astigmatism and vision very much improved by cylindrical glasses after dilating the pupils with atropia. Spectacles were ordered, and a prescription for atropia given, to be used as long as the vision was improved, and when sight had so far failed as to be unable to count fingers, he was requested to return to New York for an operation. Mr. O. D. thinks he can see just as well now as he could eighteen years ago. He has used the solution of atropia in his eyes every week, and worn the glasses continuously during the entire period.

I have had the case under my observation for the past six years, and have been unable to detect any change in the condition of the lenses during this period.

Remarks.—Cataract, which is usually a disease of old age, characterized by gray hairs and wrinkles, atheromatous blood-vessels and shrunken muscles, owing to its white color has, in the absence of any other plausible explanation for its existence, been called *senile.*

The patient suffering from incipient cataract has been assured, from time immemorial, that nothing could be done for him, that the disease was a senile one, and as inevitable as gray hairs; and the only consolation offered was, that after becoming totally blind, he might undergo a delicate and difficult operation, which would probably give him partial relief.

Dr. Risley contributed a valuable paper to a recent number of the *University Medical Magazine*, in which he said, "That while opacity of the lense is a disease of advanced life, it does not in all probability depend upon senile changes, but is originated in local pathological states involving the nutrition of the eye itself."

These local pathological changes he believes to be in the choroid, and thinks the changes in the lense and vitreous in later life to be due to the same cause as the impaired nutrition of the sclera, and the resulting posterior staphyloma and consequent myopia in children. He attributes the comparative freedom from cataract in early life to the yielding of the sclera, which prevents the lense from suffering from injurious disturbances of nutrition. In support of this theory of the cause of cataract, Dr. Risley presents statistics of sixty cases taken consecutively from his case-book, in forty of which there was a choroiditis noted, and in many of the other twenty the opacity of the lense was so far advanced as to prevent a study of the *fundus oculi.* He also reports a number of cases in which

the opacity of the lense remained stationary for many years, or even disappeared entirely upon proper treatment, directed to the choroidal disease.

CONCLUSION.

If these observations are accurate, should not our views as to the etiology, prognosis and treatment of incipient cataract be modified? If it is true that a large number of cataracts are due to general diseases, like diabetes and nephritis, and the resulting opacity of the lense may be retarded or cured by treatment directed to the general disease; if it is true that a still larger number of cataracts are due to local pathological conditions affecting the nutrition of the lense, and the resulting opacity may be retarded or cured by treatment directed to the local disease, should not our prognosis, as to the cure of cataract without operative interference, be more hopeful than heretofore?

If progressive myopia is a conservative factor which protects the lense from undue pressure and resulting disturbance of nutrition and opacity, the reason why cataract is a disease of the aged would be satisfactorily explained. In fact, I think the wearing of spectacles, in high degrees of myopia, as a prophylaxis of cataract, has long been a recognized procedure.

If our reasoning is correct, not only high degrees of myopia, predisposed to cataract, but cases of choroidal disease which result in myopia in young persons, terminate in opacity of the lense in older people, and we may, therefore, conclude that (1) All cases of eye-strain should be removed in early and late life. (2) Cataract is not due to senile causes. (3) That it may be classed among preventable diseases. (4) That incipient cataract may be, by judicious treatment, retarded or even cured entirely. (5) That even if treatment does not accomplish this

favorable result, it will put the eye in a healthier condition, and future operations will be undertaken with greater prospects of success. (6) All cases of incipient cataract should be referred to someone skilled in the use of the ophthalmoscope for examination.

A CASE OF SYRINGO-MYELIA.

BY HENRY S. UPSON, M.D., CLEVELAND, OHIO.

Two problems present themselves for solution in the diagnosis of every case of disease of the nervous system: First, What is the nature of the lesion? second, Where is it located? The first of these questions is the more important one to solve, except in certain cases of brain and spinal-cord disease, in which surgical interference is practicable; at the same time we must not forget that in spinal-cord affections an accurate localization may throw great light on the nature of the process, and may, in fact, aside from the rate of progress of the disease, be the only indication to guide us in determining with what form of lesion we have to do. Thus it is well known that the diagnostic features of locomotor ataxia consist only in symptoms which point to disease of the posterior root zones. Experience has shown that this part of the cord is much more apt to be affected by one particular form of lesion than by any other, that one, namely, called primary degeneration.

In locating a lesion in one or another part of the spinal cord, it is necessary to frame a theory which is in accordance with all the symptoms present; in considering the case before us, we will follow this plan, and, after bringing out the clinical features of the case, consider what may be deduced from them with certainty, and what with probability.

The following is the history given by the patient:

Wm. Nebbing, aged 31, box-maker. The patient, two years and a half ago, began to notice a tired feeling in his legs and pain in the small of his back. About two years ago he fell thirteen feet and struck on his back. He was considerably hurt, but not unconscious, walked home, and was laid up for three weeks. After this he considered himself well, and went to work as usual. Six months later there began to be manifest a weakness of both legs, rather worse on the right side, with twitchings of the whole limb, which were troublesome, but not painful. The patient had, more or less, pain in the back, with pricking and burning sensations in his legs. The feet and legs have swelled very often. There has been no loss of power, nor pains in the arms. He has had slight frontal headache occasionally. Has never had double vision.

The patient has had gonorrhœa half a dozen times, and has had a good deal of retention of urine, which he then had to draw with a catheter.

The bowels are constipated. There is no abnormality of the sexual function. No history of syphilis. No insanity nor nervous diseases in the family.

On examination, the pupils are equal and react to light and with accommodation. The face is slightly deviated to the left, tongue protruded straight. In hands and arms good muscular power, no anæsthesia. Triceps reflexes fairly marked on both sides. Considerable loss of power in the lower extremities, especially in the flexors of the legs and feet. The quadriceps extensor is slightly weaker on the left than on the right side. There is a good deal of twitching of the thighs and legs, partly of the fibrillar kind, and also jumpings and jerkings of the whole limb; these seem to be spontaneous, and not to depend on mechanical or reflex irritation; the patient says these jerkings persist sometimes for half or three-quarte

hour. The left thigh is somewhat smaller than the right, the legs are of good size, and about equal. Right thigh, $19\frac{6}{8}$ inches; left thigh, $18\frac{5}{8}$ inches; right leg, $12\frac{5}{8}$ inches; left leg, $12\frac{4}{8}$ inches, giving a difference of $1\frac{1}{8}$ inches between the two thighs, $\frac{1}{8}$ of an inch between the two legs. The right knee-jerk is rather weak, left knee-jerk absent, even when tried by the Jendrassik method. No ankle clonus. Plantar and abdominal reflexes lively, cremasteric reflex not obtained.

The muscles of the lower limbs respond well to the faradic current. With the interrupted galvanic current, KCC> An CC, and the response is prompt and quick.

There is no deformity of the spine, slight tenderness on pressure over the lower lumbar vertebræ.

Tactile sensibility is slightly diminished in the lower limbs, pinching is appreciated as pain, but not very acutely. Sensitiveness to heat and cold is much blunted in the lower extremities, especially over the back of the right thigh and the right buttock; in this area the patient is not at all able to distinguish between hot and cold objects, and even pinching is not recognized as painful, but is confused with impressions of heat and cold.

Urine amber, acid, 1,027, no albumen, no casts.

We are able in this case to affirm, with a good deal of certainty, the existence of an organic lesion, from the absence of the knee-jerk, and the nutritive changes which have taken place. The same symptoms enable us to exclude lesion of the brain or of the upper part of the spinal cord as the cause of the paralysis, since loss of power caused by disease in these regions is accompanied by exaggerated reflexes and only slight wasting from disuse. The possibilities are, therefore, limited to disease of the lumbar portion of the spinal cord, and disease of the peripheral nerves of the lower extremities. We will first attempt to ascertain the location of disease of the spinal

cord so situated as to be capable of producing all of the symptoms present.

Let us, then, consider the symptoms a little more in detail; and first as to the reflexes, especially the knee-jerk. This takes place in the following way: a tap on the patellar tendon causes an excitation of the sensory nerves which is carried through the posterior nerve roots to the posterior horns of gray matter in the cord; it is transmitted thence to the motor cells in the anterior horns, and from there along the motor fibres to the quadriceps muscle, which responds by a contraction. Omitting now any reference to the question whether the knee-jerk is a real reflex, all authorities are agreed that it is at any rate dependent for its existence on the integrity of the path above described, which is called the reflex arc. Excluding a few cases of irritating lesion of the brain, which may for a short time suppress reflexes by inhibition, a loss of the knee-jerk always means disease at some point in the reflex arc. When the lesion is situated in the sensory part of the arc, as is the case in locomotor ataxia, the quadriceps muscle is ordinarily not paralyzed. When, on the other hand, the motor part of the arc is affected, the same lesion which causes the loss of reflex causes a greater or less diminution in the power of the muscle; so that this tends to show that in this case a lesion of the cord producing the loss of power must be situated in the motor cells of the anterior horns, or in the anterior nerve roots. This theory is strengthened by the presence of a moderate degree of atrophy, which is regularly indicative of a lesion, either of the trophic centres in the anterior horns of gray matter, or in the nerves between those centres and the muscles.

The motor symptoms then, the wasting, the loss of reflex, the paralysis, would all be accounted for by a lesion affecting the large motor ganglion cells in the ante-

rior horns of gray matter of the cord. Another possible explanation is this: that the reflex arc is cut by the disease at a point between the anterior and posterior horns of gray matter, and the paralysis caused by an affection both of the anterior horns and of the pyramidal tracts in the lateral columns, which, taking place very slowly, would account for the considerable paralysis without the reaction of degeneration.

The sensory symptoms are somewhat peculiar. What is ordinarily called the sense of touch is made up of the ability to distinguish between four different kinds of impressions, those, namely, of pain, of temperature, tactile sensibility, by which we know the forms of objects, and the so-called muscle sense, by which we appreciate the weight of objects and know the positions of our limbs. Although these appear to be parts of the same function, experience has shown that they are represented in different tracts of the cord, so that one of them may be affected by disease, the others left intact. The sensory paths have not all been made out with certainty, but according to the latest researches, fibres which convey tactile impressions run in the posterior columns of the cord, those of temperature run probably in the gray matter not far from the central canal, or at any rate cross from one side of the cord to the other in this region; the same is true of the fibres conveying impressions of pain; fibres devoted to the muscle sense run in the lateral columns.

In this case the temperature sense is in the affected area quite abolished, sensibility to painful impressions almost or quite so, tactile sensibility only slightly diminished. If we enclose by a line the parts of the cord indicated by 1 and 2, we will show in general the position of a lesion which, affecting the motor ganglion cells and the fibres which convey impressions of temperature and of pain, and

encroaching more or less on the posterior and lateral columns, would account for the symptoms which we have found to exist.

The case presents a greater superficial resemblance to locomotor ataxia than to any other disease of the cord, from the defective gait, the loss of knee-jerk, and swaying when the patient stands with his eyes closed; but on closer examination the gait is seen to be not at all the typical one of ataxia; there are not the heel-pound and wild excursions of the legs which are seen in an ataxic of this advanced stage; there is no history of the characteristic lightning pains; and these, with the presence of undoubted paralysis and the peculiar affection of the sensibility, preclude the idea of the case being one of locomotor ataxia.

If it were not for the sensory symptoms, the case might very well pass for one of amyotrophic lateral sclerosis; this disease is, however, a purely motor affection.

We have now to consider the possibility of the existence of a lesion of the peripheral nerves of the lower extremities, which would account for these symptoms; such a lesion would have to exist on many of the nerve trunks, as the symptoms are quite widespread; and such a lesion is, as a matter of fact, usually inflammatory, and is called multiple neuritis. Its causes are many, and the course which the disease runs varies a good deal in individual cases. We may say in general that the inflammatory process affects the motor and sensory filaments as they run side by side in the nerve trunks, and that the result is paralysis with atrophy, and anæsthesia in the districts supplied by the affected nerves, giving a clinical picture not very different from the one before us. As a rule, however, the different forms of sensibility are affected about equally, so that when we find a marked loss of the temperature sense, without a corresponding diminution

of tactile sensibility, we must look for the lesion in the cord, where the paths for these two forms of the sense of touch are separated.

The form of neuritis which is most apt, from its chronic course and the unequal way in which it affects sensibility, to lead to confusion with cases of the kind before us, is that occurring in leprosy; this can, I think, be excluded in this case.

We must suppose, therefore, disease of the central portion of the spinal cord, near the central canal, and extending as far as the motor cells in the anterior horns, and probably involving to a slight extent the lateral and posterior columns. Experience has shown that a slow lesion in this region is almost invariably of the nature of a tumor, composed of a finely reticular structure with scattered cells, of the same appearance as the normal supporting substance of the cord; it is, in fact, a glioma. The new tissue is soft and highly vascular, and almost always breaks down in part so as to form one or more cavities, and from this peculiarity the process takes its name of Syringo-myelia, or cavity formation in the cord.

The cavity may or may not communicate with the central canal, but is never simply an enlargement of the same, as is the case in the condition known as hydromyelus.

Syringo-myelia has long been known as a pathological condition, which was usually first recognized at the autopsy. It was a few years ago pointed out by Schultze of Heidelberg that many of these cases may be recognized during life, from the fact that in most cases the lesion affects the central portion of the cord.

The present case is atypical, in that it affects the lumbar rather than the cervical portion of the cord, but although the latter is the usual starting-point of the disease, cases

of its occurrence lower down are by no means unknown. The only case of this affection heretofore put on record in this country was reported by Dr. M. Allen Starr, in the American Journal of the Medical Sciences for May, 1888.

The disease is characterized by its long course, and the frequent remissions of its symptoms; it is sometimes ascribed to traumatism as a cause, but whether this plays a part in the present case is, perhaps, an open question; the fall upon the back is at any rate an interesting feature in the history of the case.

No treatment has been discovered which is likely to affect the disease process, although remissions sometimes occur in connection with electrical treatment.

PALATABLE MEDICATION.

BY A. M. DUNCAN, M.D., BUCYRUS, O.

The efforts now made by pharmacists to render medicines more agreeable to the taste, may be taken as an indication that the medical profession is awake to the importance of such a result. In the effort to make medicines palatable there are certain deductions from accumulated experience that are worthy of thoughtful consideration:

1st. The proper dose is the smallest amount of a remedy that will produce the desired effect. When more of a potent drug has been administered than is needed, the system, perhaps already enfeebled by disease, is forced to eliminate the useless amount, if haply the organs are able to do so, and it requires no argument to establish the truth of this proposition.

2nd. Disease should be treated by the fewest number of drugs that will meet the indications. It would seem sufficient to simply state such a self-evident proposition, but it is often violated by the most noted in our ranks. How often we are guilty of combining several remedies in one prescription, when closer study of our patient's symptoms and clearer knowledge of our *materia medica* would have led to the employment of, perhaps, but one, with at least equally good results and less disgust and distress to the patient.

The combination of several remedies, to meet one or many indications, is often not only disagreeable and harmful to the patient, but unscientific.

3rd. Of two or more remedies equally indicated, that one should be chosen which is least repulsive to the patient.

If one drop of an almost tasteless medicine has been proven to give as good results as a teaspoonful of another disagreeable drug, there should be no trouble in deciding for the former.

Some doctors are very considerate with the children and give them nice, tasteless drops, or at least palatable, while to their father they prescribe such vile stuff that it makes him hesitate.

> To take or not to take, that is the question;
> Whether 'tis better for the man to suffer
> The pains and arrows of outrageous sickness,
> Or to take up arms against a sea of troubles,
> And, by thus drugging, end them.

4th. To secure the mere physical effect of a remedy, that form is best which makes it most palatable without modifying its therapeutical properties.

When an individual, whether child or adult, is racked with pain, starts at the least noise, and his strength exhausted, it is cruel to force him to take disagreeable medicine, if it could be rendered as effective in a palatable form. The shock to the system and the effort required to have medicine taken often do more harm than good.

The chemists are doing commendable work in isolating the active principles of drugs, and wherever these can be used they are preferable to the crude article. Some drugs now in the market are not yet proven to represent the crude drug and others are too expensive for general use, but the tendency is and should be toward their more common use.

Syrups, elixirs, emulsions and effervescent salts are admirable vehicles for the exhibition of some medicines, and render them acceptable to the taste, if not always to

the digestive organs. It is questionable, however, if the virtues of some drugs given thus are not materially modified in their therapeutical effects. The bromides and highly-spiced elixirs are hardly compatible.

As a rule, the simplest excipient is the best and most palatable, and is not tired of so soon by the patient. Glycerine is a valuable substitute for syrup and spirits with many drugs.

Some of the more disagreeable medicines can be given in pill form or capsules, and the profession is indebted to the pharmacists for their untiring efforts to make soluble pills. The propriety, however, may well be questioned of introducing a pill of a caustic or concentrated drug into the stomach, although rendered tasteless by its beautiful coating of sugar, gelatine or some mixture sold under that name, and dissolves as readily as the manufacturer claims.

If the class of drugs referred to is combined with some inert substance in proper proportion, this danger is largely avoided, and perhaps some other less dangerous remedy would do just as well and entail no risks. Some remedies are rendered more effective, soluble and palatable by triturating them with some other inert substance, and this principle is utilized in the tablet triturate, which has been received with such favor by many in the profession. This is the most palatable, convenient and soluble form in which those medicines to which it is applicable can be administered. The range is so wide now as to meet most indications for treatment. It is well to test samples from different manufacturers, as there is considerable difference in their solubility and strength.

I have found the plain sugar cone a valuable substitute for the tablet triturates for some drugs, and often more palatable, because the former is cane sugar, and the triturate is mostly sugar of milk.

These cones are about the size and shape of a split pea, and readily absorb alcoholic solutions and remain firm. Each cone will absorb about one minim of alcohol. The sugar masks the taste of the medicine and makes it a palatable, convenient, accurate, and cheap method of dispensing. A large number of drugs will at once suggest themselves to your mind, suitable to this method, among them the alkaloids soluble in alcohol.

I have used homeopathic sugar pellets to some extent, and find them well adapted for some drugs, but they absorb so little, I generally prefer the cones.

Beside the palatableness of the cones, there are other advantages that, if fully appreciated, would be far better for patient and doctor, if not to the manufacturer of pills.

It is our duty to be more considerate of our patients than we have been in the past, and give palatable medicines whenever compatible with the needs of the case.

INTESTINO-VAGINAL FISTULA.

BY REUBEN A. VANCE, M.D., CLEVELAND, OHIO.

I desire to present certain details of a case that in some respects is deserving of attention. Immediately after the operation a history of a patient and an account of the procedures resorted to to secure relief were submitted to the Cuyahoga County Medical Society, but at the present time, when the result sought for has been attained and the parts restored, a review of certain points in the case may not be devoid of interest.

The patient states that at the conclusion of her second pregnancy, in March, 1887, her first child then being three years old, some defect occurred after the waters broke that necessitated manual interference on the part of the physician in attendance; that delivery of a dead child was speedily effected; for twenty-four hours she apparently progressed all right; that vomiting and great abdominal pain then developed, and for five days she was considered critically ill. At the end of that time a gush of offensive material passed through the vagina, and after a few hours a mass of slough was discharged from that passage, followed by feculent material and intestinal gases. That the bowels had been obstinately confined since the day preceding delivery, and that, save on rare occasions, all her motions have since that time passed per vaginam. Such, in brief, was the history given me when the patient came under my care in April, 1888.

The vagina was contracted, intensely congested, and

bled freely when an attempt at exploration was made. Digital examination was accompanied by a discharge of liquid feculent material. After free dilation of the part, an examination of the patient in the knee-chest position on the supporting and confining apparatus of Bozeman, with the speculum of the latter, revealed an opening behind the uterus in the superior part of the vagina. Through this orifice liquid fecal material constantly dribbled. The rectum, small and empty, could be felt through the posterior vaginal wall. An examination of the rectum failed to reveal traces of an avenue of communication between any accessible part of the large intestine and the vaginal fistula. The patient was emaciated to an extreme degree; she had evacuations of hard white concretions from the large intestine at intervals of ten days to two weeks; and the ingestion of food or drink was speedily followed by a marked increase of the flow of feculent material from the vagina.

During the first fortnight after the patient came under my care, an effort was made to pack the vagina for the double purpose of effecting dilatation of the contractions and to divert into its natural channel the materials voided. In a measure both ends were attained: the contractions yielded somewhat and the bowels moved spontaneously on one occasion, but the discharge was much smaller in quantity than that which, despite every effort, accumulated in the vagina and demanded the removal of the dilating plug. The patient suffered so much that this plan had to be abandoned.

The only way in which the fistulous opening could be satisfactorily explored and its nature determined was by the use of Simon's speculum. It could then be examined with the finger and the fact ascertained that there were two openings—one large, with its mucous membrane thick and protruding, and the other small and contracted, with a sharp, semilunar fold between the two, projecting to a level

with vaginal orifice. Touching the large opening provoked a flow of liquid feces; no material could be felt within the small orifice and at no time was anything observed to be discharged from it.

This examination afforded evidences which clearly revealed the character of the original lesion, the nature of the processes leading to the present state of the patient and the morbid anatomical condition demanding relief in order to effect a cure. Although analogy and custom require that lesions implicating the vagina and adjacent organs should be called fistulæ, and this case as one in which the intestine and vagina are involved should be called an intestino-vaginal fistula, yet in reality it was one of preternatural anus located in the roof of the vagina. The sharp, semilunar septum situated between the two openings leading into the intestines settled this point beyond a doubt. The history of the case is perfectly consonant with a laceration involving the vaginal dome with protrusion and sloughing of a fold of intestine; and no other hypothesis will explain all the facts in the patient's history.

The first step necessary was the destruction of the septum. This I determined to accomplish with a Dupuytren's enterotome. This was procured for me by Mr. Hessler from Tiemann's, the latter part of April. The following day I placed the patient in Simon's position, introduced the blades of the instrument, and then, to my chagrin, discovered I could not lock the enterotome. The operation was necessarily postponed and Mr. Hessler's assistance invoked. He modified the lock of the enterotome in a short time, and on the next occasion my efforts proved successful—an inch and a half of the septum was grasped and firmly compressed in the jaws of the instrument. On the sixth day the enterotome was disengaged—a small amount of slough came with it. The reason it was unloosened and not allowed to slough out was owing to vio-

lent colicky pains that portended a speedy moving of the bowels through the natural passages. During the time the instrument was attached, there was a constant flow of feculent material from the vagina; a few hours after its removal a small amount of feces of natural appearance was voided from the rectum. No great amount of distress was experienced from the action of the instrument, and what the patient did suffer from was more owing to the presence of the handle in the vulva than the blades in the bowel. Large quantities of very hot water were injected into the vagina three times a day after the removal of the enterotome, and no examination attempted for a week.

The fistulous opening was then found much smaller than before; no trace of intestinal mucous membrane was discernible, and when the finger was inserted no septum could be felt, but the parts seemed firm and gave much the same sensation as that yielded by forcing the end of the finger into a small thimble. Although feculent material was still voided constantly, it was much less in amount than before, and the bowels could be made to move through the natural channels by the aid of cathartics.

The next step was to denude the edges of the orifice and close the fistula with silver sutures and a Bozeman button. The patient was operated on in the knee-chest position and the opening closed with seven sutures. This was done May 15, 1888. On the twenty-first the button was taken off and the wires removed. Hot water injections were used twice a day after the operation. It was thought best to keep the bowels freely soluble with mercurial cathartics from the day of the operation until the week after the sutures were taken out. The recovery was rapid and perfect. I have seen the patient recently and she remains well.

THE EARLY DIAGNOSIS OF EXTRA-UTERINE PREGNANCY.

BY J. C. REEVE, M.D., DAYTON, OHIO.

No subject in gynecology, if, indeed, in any department of medicine, has made such rapid and substantial progress within the last decade, as extra-uterine pregnancy. Light is finally breaking in upon one of the most intricate and complicated of pathological processes, and by the extension of physiological knowledge, and by clinical observation, that which was an unsolvable riddle to former generations is becoming fully understood. The cause of humanity has gained equally with science. One of the most serious calamities which can happen to woman in connection with the transmission of life, one which is overwhelming in its effects and appalling in its sudden mortality, is at last deprived of much of its danger by the resources of therapeutics and the boldness of modern surgery.

The part which this country has taken in the advance of this subject is cause of pride and congratulation. The clear recognition of the necessity of laparotomy for rupture of the cyst, by Stephen Rogers of New York,* marks an epoch in the history of the subject. Others had suggested this measure before, but he, more clearly and more vehemently, urged the necessity of this operation upon the profession nearly twenty years before it was executed. Parry's treatise, published in 1876, is another landmark. This

*Trans. Amer. Med. Assoc., 1867.

gives the scattered knowledge of the times, admirably collected, presented and commented upon. The scholarship, the judgment, the critical acumen of this little volume have won the highest encomiums from foreign writers, who have borne testimony to the great loss which medical science sustained by the author's early death. More recently, the application of electricity for causing the death of the fœtus, and thus by harmless means rescuing the patient from imminent peril and saving her from the dangers of laparotomy, has given renewed life to the study of the subject. This measure had in this country its earliest successes, and cures by it have since been so numerous that it has conquered for itself a position as a safe and reliable remedy, and as one of the glories of American gynecology.

I fully recognize the fact that a paper presented to an assemblage of practitioners should be based largely upon personal experience, and that doctrine should be illustrated, or theory enforced, by the recital of actual observations. I deplore, therefore, that I have not clinical experience to lay before you. Nevertheless, it is justifiable to present such a paper when the subject is one upon which but very few men have had a great deal of practical experience. Mr. Lawson Tait has had to do, ante- and post-mortem, with about seventy-five cases, yet he never had the opportunity of making an early diagnosis. Dr. Thomas has seen over thirty cases. These are the largest experiences of the world. Winckel of Munich, all his life at the head of a large obstetrical and gynecological clinic, has met with but thirteen cases. The vast majority of cases of extra-uterine pregnancy have been reported by individuals who never saw one before, or have seen but a few cases. We are with this subject, then, exactly as we are with deaths from anæsthetics. But few men have had the misfortune to see more than one; no one

has seen many of them. Still, from a careful study of the single cases, as reported by individuals, much of value has been learned as to the different modes in which the fatal accident occurs, and as to the best means of avoiding it. By such a study of isolated cases of extra-uterine pregnancy I attempt to present one portion of the subject. The whole subject is far too wide for complete consideration, and I limit myself to early diagnosis. My original intention was to take each symptom and note its presence or absence in each reported case, and then tabulate the results. A paper upon this plan would manifestly be complex and extensive, and probably not as useful as one in which the results of a careful study of cases are clearly presented, each symptom which may be present being considered in regular order. Such a paper I have attempted to prepare, impelled by the fact that the signs and symptoms of abnormal gestation are not so fully presented in the text-books as they should be. From the nature of things, the majority of cases will fall first into the hands of the general practitioner, and he should be acquainted with the points of diagnosis, that relief may be afforded the patient in due season.

Cases of extra-uterine pregnancy may be classified as follows:

I. A very small number present no well-marked symptoms, and go on to full term; labor sets in, and only then the true state of affairs is discovered.

II. A somewhat larger, but still a relatively small number, are first announced by the symptoms which speedily overwhelm the patient. Rupture of the cyst occurs, and death, by shock and hemorrhage, speedily ends the scene.

III. A large majority of cases, in which marked symptoms are present from an early period. Of these symptoms no single one may be pathognomonic, yet by

concurrence of several of them, or by several appearing in succession, a diagnosis may generally be made. It is to these symptoms that I beg leave to direct your attention.

First in order comes the probable existence of a pregnancy. The reflex signs of this condition are present; on the part of the digestive system, depraved or changed appetite, nausea, vomiting, salivation. The breast and nipples show the usual changes. As a general rule the patient believes herself to be pregnant. This has been the case so frequently that some authorities hold it to be essential. Bernutz and Goupil found this feature absent but four times.* When the patient has already had children, her testimony is, of course, more valuable. I know of but one authority who discredits the value of this point in the history of a case. Mr. Tait, in his late work on ectopic gestation, expresses the opinion that no reliance can be placed upon it. Still, at a later period, in making a diagnosis of ruptured cyst, he lays due stress upon the probable existence of a pregnancy when the overwhelming accident occurred.†

There are two points to be noted in regard to the pregnancy: First, in extra-uterine cases a considerable period of barrenness has preceded its occurrence so frequently as to have attracted especial attention. The existence of a desquamative salpingitis, whereby the tubes are deprived of their epithelial lining and brought to a condition similar to that of the interior of the uterus, is maintained by Mr. Tait to be the leading etiological factor in these cases. The explanation seems reasonable and far more probable than that of an obstruction of the tubes. If, then, a patient is pregnant some years after the birth of a child, or becomes so only after several years of married life, the fact should receive due consideration.

*Clinique sur les Maladies des Femmes.

†Brit. Med. Journ., June 28, 1884, p. 1250.

Second, the ordinary symptoms of pregnancy are likely to be exaggerated, especially those of the pelvis. In the language of Parry, "the pregnancy is a stormy one."

Next in order comes derangement of menstruation. There may be the amenorrhœa which belongs to the ordinary pregnancy, but much more frequently the flow is irregular, and it may be excessive and even continuous. Recurring gushes of blood occur, and, with pelvic pains, often lead both patient and practitioner to believe that an abortion is taking place. There will be often no further doubt upon this point should the decidua be expelled *en masse;* it is taken for a "mole" or "false conception," and looked upon as the termination of a miscarriage.

Examination of the pelvic region reveals, in many cases, great tenderness of one or the other iliac region or of the hypogastrium; there may be so much as to prevent a satisfactory investigation. Great pain at some point of this region may be complained of, and the pain radiates to the loins and down one or both thighs. There may be a febrile condition present and all the evidences of successive attacks of pelvic peritonitis.

A vaginal examination would of necessity follow such symptoms. In a case of extra-uterine pregnancy such an examination shows certain changes in the uterus and the presence of a tumor. The uterus is enlarged, in the earlier period, in proportion to the duration of the pregnancy. It is displaced; the gestation cyst has pushed it to one side or the other, or forward, so that the cervix is found close to the pubic arch. The os is patulous, the finger easily enters it. The uterus is empty. If amenorrhœa is present, the practitioner would, of course, hesitate to ascertain this by the passage of the sound; but when metrorrhagia exists, or the decidua has been expelled, there need be no hesitation. The tumor to be felt *per vaginam* presents some well-marked features,

which serve to differentiate it from anything else generally found in this locality. It is round, smooth, elastic, giving the sensation of a tense cyst, and, as a general rule, exquisitely tender. It is situated in close proximity to the uterus, yet generally can be made out to be independent of this organ. Two features demand especial attention: First, the vaginal wall over this cyst or tumor shows active pulsation; vessels can be felt beating by the finger. This feature was recognized long ago by Baudelocque. Second, the size of this tumor can be observed to change within a comparatively brief period. The growth of a gestation cyst gives an increase in size more regular and rapid than belongs to any condition likely to be confounded with it. Thomas says it can be noted from week to week.

In addition to more or less of these symptoms, or, possibly, entirely independent of any of them, may come now attacks of severe pain with symptoms of collapse. The patient is found pale, faint, almost or entirely pulseless, with most severe abdominal or pelvic pain. She seems about to die, and the practitioner may be at a loss to account for her condition unless acquainted with the course of this form of gestation. From this collapse the patient may slowly rally, to suffer again in a short period from similar attacks. Different explanations have been given of these severe paroxysms of pain, accompanied by profound depression of the vital powers. They have been attributed to contractions of the walls of the cyst, and to uterine contractions. There is no doubt now that they depend upon partial ruptures of the cyst, or of vessels on its walls, accompanied by a certain amount of hemorrhage. Post-mortem examination of cases in which these symptoms have several times occurred, has revealed a collection of clots, the difference in age of which could be

plainly seen.* The great practical fact is that a succession of these paroxysms may occur before the final and fatal rupture which they most surely foretel.

In a patient presumably pregnant, having had more than one such attack as this, and having a tumor to be felt *per vaginam*, there could scarcely be a doubt of the existence of extra-uterine pregnancy. But one symptom more could add to the evidence. This is, the expulsion of the decidua. This membrane may be thrown off *en masse*, when it will be readily recognized. In the case under my observation I drew it on my finger like a thimble. It may be discharged piecemeal. The existence of shreds, therefore, in the uterine discharge of a patient presenting any of the symptoms detailed, should awaken suspicion and lead to a microscopic examination. The expulsion of the decidua is a sign of the highest value, and is, by good authority, even held to be pathognomonic.

Two symptoms may seem to have escaped consideration: they are ballottement and the effects of pressure upon the pelvic organs. They belong to a later period than that to which this paper is limited. Ballottement has been observed by Thomas as early, however, as the third month.† Only exceptionally can it be elicited at so early a period, even by a skillful examiner. It should always be sought for; if present, it makes the diagnosis a matter of absolute certainty. Pressure symptoms, of course, become more and more pronounced as the case advances in age.

A diagnosis of extra-uterine pregnancy is to be made, then, by a careful study of the history and of the signs and symptoms of the case in hand. No one of the disturbances it occasions or the changes it causes is of very great weight when standing alone; occurring together, however,

*See paper by Dr. Johnstone, Journ. Amer. Med. Assoc., Oct. 27, 1888.
†Amer. System of Gynecology, Vol. II.

the value of each increases in a geometrical ratio. There is an order of occurrence, also dependent upon the period or progress of the pregnancy, which should be borne in mind. The value of a coincidence of the symptoms was recognized by Bernutz and Goupil, who taught that it was by an *ensemble* of symptoms that a diagnosis could be made. An interesting illustration of what is here presented was related by Dr. Hanks of New York, at the meeting of the British Medical Association in 1886.* A gentleman, in a consultation, maintained that the case was one of extra-uterine gestation, but agreed to rest the decision upon a microscopic examination of some discharged membrane. This was reported not to be decidua, whereupon he averred his belief that a mistake had been made. A necropsy soon after proved that he was right. It is stated that the microscopic examination was made by a student.

A summing up of our knowledge upon this subject would seem to be that while in some cases of extra-uterine gestation a diagnosis presents the greatest difficulties, and in a small number it is impossible to make one, in the majority of cases it can be readily done, and even more easily and certainly than that of a normal pregnancy. This has been maintained by the very highest authority, both in this country and in Europe.† Moreover, a diagnosis can be made at an earlier period than in a normal pregnancy. It has been made as early as the eighth and even as the fifth week.‡

The symptoms which have been detailed may be classified partly in reference to the order of their occurrence, but especially as to their diagnostic value, as follows:

*Brit. Med. Journ., December 4, 1886, p. 1094.

†Among others: Berry Hart and Dr. Aveling, Brit. Med. Journ., December 4, 1886. Winckel, Lehrbuch der Geburtshulfe, 1889. Garrigues, Trans. Amer. Gyn. Society, 1882.

‡Papers by Dr. Janvrin and Dr. Hanks, Trans. Amer. Gyn. Society, 1886, 1888.

I. *Suggestive.*—*a.* The general and reflex symptoms of pregnancy, especially if the pregnancy had occurred after a considerable period of barrenness.

b. Disordered menstruation, especially metrorrhagia coincident with symptoms of pregnancy; gushes of blood, accompanied by severe pelvic pains.

c. Severe pain in the pelvis; attacks of pelvic pain followed by tenderness in either iliac region, and other symptoms of pelvic inflammation.

II. *Presumptive.*—*a.* The existence of a tumor; this tumor presenting the characteristics of a tense cyst, sensitive to touch, actively pulsating; steady and regular growth of the tumor to be observed.

b. The os uteri patulous, the uterus displaced and empty.

III. *Certain.*—*a.* Paroxysms of violent and overwhelming pain in the pelvis, with general symptoms of collapse.

b. Expulsion of the decidua.

It remains to consider the conditions most likely to be confounded with or mistaken for extra-uterine gestation. They are: abscess of broad ligaments; pelvic hematocele; retroversion of gravid uterus; a small fibroid or fibrocystic tumor of uterus; a small ovarian or dermoid tumor; a parovarian cyst; tubal disease, as pyosalpynx; pregnancy in one horn of a uterus bicornis; intra-uterine pregnancy. It is not necessary to go over these *seriatim.* While each may in some respects closely resemble the disease under consideration, other characteristics, such as rapid growth, paroxysms of severe pain, with a history of probable pregnancy, will serve for a differential diagnosis. Undoubtedly a pregnancy in one horn of a double uterus would present the greatest, if not insuperable, difficulties of diagnosis.*

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*Thomas: Amer. Syst. Gyn., Vol. II.

The differentiation of extra- from intra-uterine pregnancy is also to be considered. It is most likely to be needed, however, at a later period than that to which this paper is limited. When the pregnancy approaches term there may be such an unusual thinness of the uterine walls that the child seems to be immediately under the skin, and this condition has caused mistake upon several occasions.

The warrant for presentation of this subject, based upon a study of reported cases rather than upon observations, has already been stated to be the necessity of directing the attention of the profession to the subject and laying before them the means of recognizing it. An awakened attention is the first step to diagnosis. In the case which fell into my hands,* I recognized that I had something the like of which I had never seen before, and only realized the truth when the extrusion of the decidua threw a sudden light on the case. And it is interesting to read of cases in which even eminent men were befogged until some new symptoms flashed the truth upon them.†

Still more necessary does it seem to present a careful study of this subject, since doubt has been thrown upon the possibility of an early diagnosis in one of the latest publications upon the subject.‡ This book emanates from one whose experience is the largest in the world. That with this large experience the author has never had an opportunity of making a diagnosis before rupture of the cyst, is indeed a singular fact, as he himself recognizes. But because he has not had this opportunity, it is unscientific, to say the least, to throw doubt upon what other men have done and reported; and the statement he makes, that extra-uterine pregnancy presents no symp-

* Trans. Amer. Gyn. Soc., 1884.

† See Dr. Lusk's case, Amer. Journ. Obstet., 1881, p. 333.

‡ Tait: Lectures on Ectopic Gestation.

toms other than, or different from, those of disease of the tubes, finds its negation and contradiction in almost every reported case.

This question of diagnosis has been complicated by that of treatment. To consider the latter is not within the scope of this paper; still, a few words are necessary as to this feature and as to the relation between the one and the other. After rupture of the cyst there is but one remedy—laparotomy. The only hope of the patient lies in prompt and bold surgery. Before rupture, electricity has afforded most excellent results; it can be applied by the general practitioner, and has not shown, so far, any evil effects or consequences. Still, there are those who advocate laparotomy as being the best measure even before rupture. Without questioning either their wisdom or their judgment, truth compels the statement that the advocates of surgical methods have displayed a partisanship which does not belong to science. The perils of laparotomy have been belittled, and the possible injurious effects of electricity have been magnified. Not only these, but the diagnosis of cases in which electricity has been successful has been repeatedly questioned, and the capacity of those who have observed them openly doubted. The position has been taken that because ballottement was not observed, or because fœtal bones were not afterward thrown off, there was no certain diagnosis. Most of the observations of the successful use of electricity were at a period before ballottement could be expected, and before fœtal bones exist. Those who thus doubt are in the position of those who would question a diagnosis of pleurisy with effusion, after recovery of the patient, because no liquid had been presented for inspection. Again, under applications of the galvanic or faradic current the tume- in the vagina has repeatedly been observed to beco less tense and less tender, to cease to pulsate, its t-

ness diminish and slowly disappear. Coincident with these changes, the sufferings of the patient have abated and she has been restored to health. Simply, the treatment confirmed the diagnosis. How often in another line do we pursue a similar course and accept the results without question. The nature of some tumor or ulcer is obscure; we submit the patient to a course of mercury or the iodides, and the lesion disappears. Its nature is then clear. Therapeusis has not confirmed, but it has made, a diagnosis.

I present from Charpentier* the following list of diagnostic errors made by eminent men, premising, however, that most of these errors were made at a period which, in a subject upon which our knowledge is so rapidly increasing, may be termed remote:

Huguier, uterine pregnancy taken for extra-uterine; Schlesinger, same; Depaul, extra-uterine pregnancy taken for a fibroid; Dolbeau and Charpentier, extra-uterine pregnancy taken for a retroverted pregnant uterus; Fournier, case misunderstood until the introduction of the finger into the uterine cavity; Martin, tubal pregnancy with hematocele, no diagnosis; Boinet, diagnosis halting between ovarian cyst and extra-uterine pregnancy; Hutchinson, similar; Orth, two cases taken for hematoceles; Leven, hematocele; Capuron, Parent, taken for anteversion McCallum, tubal, recognized only at autopsy; Walther, pregnancy in a double uterus, sound entered the empty cavity; Jobert de Lambelle, abdominal pregnancy taken for an ovarian cyst or a uterine tumor; Bricheteau, ovarian cyst taken for an extra-uterine pregnancy.

* Traité Pratique des Accouchements, 1883, t. i. p. 1044.

DISTURBED EQUILIBRIUM AS A FACTOR IN THE ETIOLOGY OF DISEASE.

BY ELI CONN, M.D., AKRON, O.

That most learned and very able thinker—perhaps the most renowned scholar in physiological science of the present—Michael Foster, has well said: "The more physiologists know about the living body, the more they grow to the conception of the theory that there are two processes always going on in the body—a building up and a breaking down."

These two processes, gentlemen, namely *constructive* and *destructive* metamorphoses, are a necessary and all-important part of the economy—indeed, they are the whole of life—for if we consider the organism in its entirety, from the single cell to the most perfect man, we find everywhere the one universal law—the law of change—stamped upon every tissue. Constancy of growth and reparation is only equaled by the same constancy of decay and disintegration. We have *matter*, *motion* and the resultant of the two, *force*. These, under the law of its being, constitute every form of organization.

According to the best biological idea, our bodies are made up of cell elements, each single cell capable of maintaining life of its own, its own mode of alimentation, secretion and excretion. These living units constitute by their aggregation a veritable empire—a union of cities, more or less prosperous, having each its own independent existence, but demanding for its maintenance certain

special conditions. Cells trained and organized, they require each a particular pabulum, which must be conveyed to them in due sufficiency by the numerous vessels, comparable to the intercommunication existing between the inhabitants of a great city or community.

But these living cells, by the rapid changes which they assume in the metabolism of the tissues, fabricate excrementitious products more or less toxic. It is necessary that these excrementitious products shall find a ready exit, and that a system of sewerage, if I may be allowed the expression, shall conduct away the daily waste matters. They must also be in communication with each other, and be in due subordination to the central power which directs them. This internuncial rôle devolves upon the nervous system. The functioning power of the organism, and every organ and tissue are under the control of the nervous system, regulated and controlled by that system, in some one or more of its many ramifications.

So we have in the make-up of this organism these two processes constantly taking place. The work of growth and reparation, together with the decay and disintegration of the tissue changes, make up the phenomena of life in its varied phases of "natural" or "perverted."

Again, the seprocesses are under natural, or physiological law, if you please, the bounds of which cannot be passed; nay, more, cannot be violated with impunity. First, the universal law of change—matter in motion; inert matter is dead. No tissue of the body, not even the blood, but that is constantly being used up, renewed and again used up. A second great law is, that this building up process demands pabulum from an external source, pabulum too, in a certain condition, both as to quantity, quality and mutability. It also requires that the refuse material be removed, hence we have the four great emunctories of the system, viz., the alimentary canal, the

kidneys, the lungs and the skin, together with their innumerable tributaries, which altogether make up the most complete system of sewerage yet constructed. Another law is that known as natural selection—each tissue of the body having the capacity of selecting that which is appropriate and rejecting all else.

Again, another great law of the organism is that known by various names, such as *tone*, *vital resistance*, *vital force*, the *vis resistentiæ* of the ancients. With respect to the question of *vital force*, there is very great latitude of opinion. And I am free to confess that I find great difficulty in thinking of *protoplasm* as a substance, and venture the suggestion that it will ultimately be found to be the development of energy, and nothing tangible.

We have seen, as above, that these processes are constantly going on in every tissue of the body. Activity is life. Inactivity is death. Matter organized on a plan and in motion is the real life of every form of origination. Inert matter is dead, and soon becomes unorganized.

But if these two processes are constantly taking place in the living organism, and that under law—natural or physiological law, laws which cannot be violated—they correspond with, and are in harmony to, the dual lesions emanating from diseased action, viz., lesions of *construction* and lesions of *destruction*.

They also suggest the two great classes of remedies, viz., those that increase tissue metamorphosis or constructive changes, and those that retard or inhibit such changes, *nutrition* and *depuration*. Nutrition, that constructive activities may not terminate in destructive lesions, because of structural exhaustion; and depuration, that constructive activities may not be embarrassed by the pressure of effete and toxic accumulations.

All organized beings grow by that they feed on. The human organism is no exception to this rule; therefore,

nutrition is all important. But nutrition is a tissue function, subject to the laws above referred to. That there may be a healthy nutrition, that prince of pathologists, Sir James Paget, as quoted by Professor Herrick, has given us these four propositions: first, right state of the blood; second, a not distant supply of blood to the part; third, a certain nerve influence; fourth, a right state of the part itself. Who doubts the truth of these propositions? These are fundamental, and when at their climax, and in connection with the changes above referred to, viz., the infinite arrangement and management of an exceedingly complex system of molecules, *constitute* the phenomena of life.

Given, then, the organism, with these two processes at their best, or in a state of equilibration of tissue metamorphoses, a due supply of nutritive material, together with a few and proper *exeunt* of all waste materials subject to the law of its being, and we have a perfect or healthy organism.

Let us inquire for a little after the disturbing causes that lead to diseased action; for it is admitted that disease is no longer an entity. First, the advanced age of the cell; and this empire, so strong and flourishing during the first years of life and adult age, is destined under the universal law of change to see its forces decline as the years roll on, until death ends the scene. This is natural or physiological death; and of this cellular empire, once so strong and flourishing, naught remains but the mineral ingredients to mark the sight of a once flourishing and prosperous city or nation.

Under other circumstances, the food necessary for the life of these cells does not come to them in sufficient quantity, the channel by which they are carried being obliterated, and the community succumbs from inanition. Or it may be the excretatory passages are obliterated, and

just as we see our large cities the prey to infection and disease, from the faulty working of their sewers, so the economy is poisoned by the retention of excrementitious products: disease and death the result.

Again, it may happen that certain of these communities shall break the compact which holds them together. They would fain live an independent life; their cells take on an abnormal development, and, being no longer obedient to the central power (the nervous system), they become a source of enfeeblement or death to the entire organism, as happens in the case of tumors of malignant nature. These are the destructive lesions, a lower grade of tissue change than the former two, the constructive lesions.

Up to this point we are all agreed, and upon *this* foundation *we* rest our medical faith. But here the profession part company. Those who are not willing to stand up before nature and interrogate, and interrogate until they wring from her hidden recesses the *true* cause of diseased action in the organism, betake themselves to theory and theoretical notions.

Planting themselves upon some supposed cause of disease, they bend all their energies, yea, they compass sea and land, to make one proselyte—gain their point; and when driven by the logic of events from position to position, they finally retreat behind some ancient dogma or accepted creed, which has nothing to sustain it but popular prestige or venerable antiquity.

In view of the chaotic incongruity of pseudo-science, and the "learned" "jargon" of superstition, enshrined in all the text-books, taught in all the schools, and revered by a vast majority of the human race, we must needs ask, What recourse is left to the conscientious student of medicine, who is unwilling to stay in the rut, to dole out by set rule the routine remedies, and to strive in vain to

appease his scientific hungering with the husks of hypotheses? Throughout the medical world, routine methods and antiquated theories are no longer competent to satisfy thinking minds. They refuse longer to rest their medical faith on dogmatic assertion and time-honored traditions, insisting that *medicine*, *mystery* and *superstition* have long enough been in vogue as synonymous terms.

The one unremitting search of the day *ought* to be for a key to the *true* nature of disease and for remedies which shall do no violence to natural laws, instead of the almost universal chase after *germs* and germicidal remedies, which (if the germ theory were true) must forever remain a fruitless search; nevertheless, the great mass of the profession have joined in the chase, joined, too, with the enthusiasm that children chase butterflies, and with apparently about the same practical results. Rampant rides the theorist, both in the field of practical and preventive medicine. At one time the theory known as the Hippocratic, now it is the germ theory—those pestiferous, ubiquitous, infinitesimally small, yet infinitely numerous animalculæ, which inhabit earth, air and water, and in which we verily have our being, a living, moving, floating sea of infuriated "beasts," ready to pounce upon and literally devour this organism at the opportune moment. There has come down a great *London fog* upon the medical mind of this day and age, come down from the time of Hippocrates and Galen, that the fluid of the organism, especially the blood, is primarily implicated, vitiated, and that it becomes the great curse of diseased action, when, in point of fact, the blood itself is never the real part affected; the real point of attack is the tissue cells themselves. The blood is no "wooden horse" by which disease enters to the citadel of life. It is the supply stream of nutritive material for constructive metabolism and energy, and the efferent

channel for the elimination of waste products, or it is the *commissary* and the *scavenger* to the tissues.

A diathesis of whatever kind is always associated with, first, imperfect nutritive metabolism, and second, imperfect excretion of the result of retrograde metamorphosis.

But these theorists tell us that on the borders of this cellular empire dwell foes innumerable, foes, too, that know of but one law, the law of self-multiplication; that they wait but the opportune moment to enter as hostile troops and occupy the territory. These foes are the pathogenic microbes of the bacteriologists. Beautiful theory, and withal captivating, and deep down in the heart of the profession the wish went out that it might prove a *true* theory, but after more than a decade of experimental search and investigation, what are the practical results? Without going into details, I think it may all be summed up in that little word "*nil;*" yea, more, in the multitude of theoretical speculation the medical mind has been swayed from the truth, from that vigorous and painstaking investigation required when we attempt to interrogate nature's laws, and furnish a remedy for any defect in the same.

But your best antisepticist is, after all, only a blind giant, armed with the club of Hercules, striking at random; if, perchance, he hits the disease, woe to the disease; but if, perchance, he strikes the patient, woe to the patient; thus hurling his whole therapeutical artillery at some imaginary microbean invader, apparently forgetful of the fact that what will kill the disease will dispatch the patient from this sinful world to Abraham's bosom.

I have two wonders in regard to these men: the first is, how the medical profession got along without them before they were born. The second is, what will become of us after they are dead. But if you want to achieve

anything in medicine, the field is wide. Nearly the whole science of medicine is in a state of anxious uncertainty, waiting for the master-mind that shall organize order out of chaos and crystallize into lines of symmetry the valuable isolated facts now floating around. Sometime in the future, there will be a *real science* of medicine.

But to conclude: given the organism with these two processes in a state of equilibration of tissue metamorphosis, duly supplied with nutritive material, and a proper removal of effete matter, and we have all the conditions for a healthy performance of the different functions of life; aye, more, we have an organism capable of maintaining a perfect or healthy standard in the midst of never so many germs. And this empire, to which we have likened the organism, exists, like the United States among the nations of the earth, without *fear* of harm from without, so long, but only so long, as she observes and obeys all the laws of her constitution, both internally and externally. But break this equilibrium, change the natural to the unnatural, the physiological to the pathological, the right function of any organ or tissue to the abnormal or perverted, vitiate, by whatever mode or method, a single cell of this vast empire, and you have a cause for diseased action, though the disturbance be but the slightest, so small that you call it "functional;" yet, like the firing on Fort Sumter, it may send a wave throughout the empire, so that every emunctory of the system will be up in arms to turn the rascals out.

Therefore, we conclude that we have a real foundation, founded upon a scientific and sure basis, on which to rest our medical faith, without going after theory and theoretical notions, and that the conditions furnish the real or starting-point in any disease.

THE DUTY OF THE OHIO STATE MEDICAL SOCIETY TO CONSUMPTIVES.

BY J. E. WOODBRIDGE, M.D., COLUMBUS, OHIO.

In calling your attention to the duty of the Ohio State Medical Society to "Consumptives and their Medical Advisers," you will perhaps deem me guilty of wasting your time on a subject on which little of consequence can be said, and which, at most, is a matter of minor importance. If so, your opinions are well sustained by the summary manner in which the subject has been treated by the best medical authorities in all ages of the world's history.

Hidden away in the nomenclature of diseases you may find the various names by which it has been designated. Search your text-books, but you will find nothing in the manner in which phthisis has been treated to lead you to conclude that the disease is one of unusual importance; and if you search the records of this Society for any evidence that consumption demands, or ought to have, any special attention paid to it or to its victims, you will find it wanting; and yet we have under consideration an infectious disease more fatal than small-pox or cholera or scarlatina, more fatal than all combined—in fact, numbering among its victims, as shown by the last censu[illegible] the United States, more adults than all other infe[illegible] and contagious diseases together; affecting all cla[illegible] people, of every age, condition and se[illegible]

by slow gradations, extending often over a series of years of hopeless invalidism to the grave. Its death-rate is truly appalling. But we have become accustomed to its ravages, and in a measure reconciled to them, and regard deaths from consumption as a kind of visitation of Providence, from which there is no escape, and yet the same kind of a visitation of cholera or small-pox would arouse such a feeling of horror and indignation as none of us would like to face.

The consumptive, however, pursues the even tenor of his way, and in a large majority of the cases that come under my observation, insufficiently or improperly fed, or both, unscientifically and generally poorly clothed, their dying arouses no indignation, and often but scant sympathy. They are regarded simply as the victims of an incurable disease, and walking about with their clouded brows awaiting the dropping of the curtain over the final act, they constantly remind one of the terrible inscription over the entrance to Dante's Hell, "All hope abandon ye who enter here."

But a new day is dawning on our friends.

When Lewis A. Sayre, at the meeting of the American Medical Association at Philadelphia, in 1876, battled bravely and alone for the true pathology of the so-called tubercular diseases of joints, he was perhaps all unconsciously brushing away the mysticisms and errors of ages from the pathology of a far more important disease; and when a Swiss peasant, condemned to die of this disease in the sunnier lands to which he had expatriated himself, returned to his bleak mountain home to end his days, and instead, continued to live, he touched the key-note to its treatment, and the time is almost here when the pathology and treatment, and even the nomenclature, but, most of all, the prognosis of the disease must be re-written, and in a far more hopeful spirit than has characterized its history

in the past. Look at that past. Glance at the literature of consumption during the past century. Study the writings and teachings of the best authorities of the present day. What a conglomerate it is!

Future generations, reading this stuff, will say it was written by isolated members of a widely scattered profession, having no means of communicating with each other, and yet this is the close of the nineteenth century, the age of telegraph and telephone, of county, state, national and international medical societies. But none of them, so far as my observation has extended, pay much attention to the most fatal disease which we are called upon to treat.

What have we of the Ohio State Medical Society done? Nothing. In 1878 Dr. Loomis read, before the American Medical Association, an able and exhaustive report on the climatic treatment of consumption, which bore evidence of careful thought and research; it was fully abreast of its time.

But ten years have passed since then and we live in an age of progression—an age in which mighty events are crowding each other off the stage of action. A decade now means more than a century did some hundreds of years since. And can any gentleman point me to any positive, more recent advances we have made in knowledge of the pathology, prophylaxis, or treatment of consumption? While wonderful discoveries are being made, and the profession which we love and practice is making its full share of them, the great mass of that profession is in no sense better prepared to answer any question bearing upon the treatment of this disease than were its members three hundred years ago.

Give any large number of physicians a typical case of incipient consumption and ask them what they would do for it, what kind of reading, think you, their answers would make? From a knowledge of what has gone be-

fore, it would be safe to say that the patient would receive some very contradictory advice. He would probably be told to stay at home, take cod-liver oil and tonics, and a hundred other remedies; to use Borgeon's method; to go to southern California, New Mexico or Colorado; to Rome; to the Riviera; to Davos Platz, and, in short, to almost every inhabited or habitable spot on the globe. One patient, after consulting the family physician, visited Philadelphia, New York and Boston, consulting seven eminent gentlemen; was advised to go to southern California, to Bermuda, Chautauqua Lake, Denver and Florida. All could not be right. Nearly, if not quite all, were probably wrong. Yet these are far above the average members of the medical profession. How, then, would a patient fare with the average practitioner? A gentleman, resident of New York city, after consulting his family physician, who advised him to go to Europe, but who frankly admitted that he did not know what would be the best place, called in an eminent authority who advised him to go to Rome. In various parts of Europe he consulted the most celebrated physicians, and finally returned to this country, and after this long experience gave as his deliberate opinion that neither the medical men of Europe nor America know anything about the climatic treatment of consumption; and it must be confessed that even the best medical literature of the day or age gives such varied and widely divergent theories on the subject, that such opinion would seem to be well founded.

Now the medical advisers of consumptives should be taught enough about the prophylaxis and treatment of consumption to save the profession the disgrace of so much contradictory advice to the victims of so important and wide-spread a disease.

Your author has given many years to the subject, and if his time and yours were unlimited he could tell you of

many existing differences between celebrated health resorts, as seen through partial and highly colored advertisements, and impartial, truth-seeking eyes.

He has wintered in southwestern Texas, a few years since the Mecca for consumptives, and in the southeastern portion of the United States; has visited various points on our Atlantic coast and many of the resorts of Colorado, New Mexico and southern California, and has found that, in many instances at least, the place that from a distance of some hundreds or thousands of miles seemed most desirable, on closer inspection proved least so, and it is his belief that the ideal health resort for consumptives, if there be one, has either not yet been discovered, or sufficiently advertised to attract much attention. Colorado, with its wonderful sunshine, pure air, high altitudes, grand scenery and occasional pine forests, possesses many advantages not found elsewhere, but some of its best advertised health resorts are unfit for residence of even healthy men. As, for instance, Colorado Springs, which really has much to recommend it, was, at the date of my visit, November, 1888, a town of about seven thousand inhabitants, without sewers, is at times exceedingly dusty, is subject to high winds, has irrigation ditches on each side of its streets, and the sun sets early, making the day short.

Your author asked one of the leading physicians of the place how he could reconcile the existing conditions with its claims as a health resort. The doctor answered that, "dust is considered an antiseptic to external wounds, and may it not perform the same office in the lungs?"

Many such instances might be given to show the insurmountable obstacles which lie in the path of the individual practitioner who endeavors to do his whole duty to his lung patients. Individual members of the profession may, and no doubt have, in exceptional instances, at

least, made some progress in a knowledge of this branch of our subject, but it has been at a fearful sacrifice of human life, and it may be doubted if the lesson is always worth the price paid for it.

During all my investigations, one prominent fact has always presented itself, viz., that the climate which seemed most nearly curative of consumption is most aseptic, and, as a consequence, when you place your patient under the best climatic influence, you also place him where he will do least harm, where he is least likely to communicate his disease to his friends and attendants. And if this is true, and can be demonstrated to the satisfaction of the Ohio State Medical Society and of the American Medical Association, so that these bodies could go before the world confidently teaching the correct climatic treatment of this one disease, would not that add greatly to their already high reputation? We are rich in deep thinkers and careful and scientific investigators, and here is a broad field for the exercise of their talents.

But how is this to be done? Let the Ohio State Medical Society appoint a committee charged with the duty of the investigation of all matters of interest to consumptives and their medical advisers, and especially of the climatic treatment of the disease, and report the result of its labors at the next meeting of this Society. Such a committee could accomplish much that to the individual practitioner would be impossible.

DISCUSSION.

Dr. H. J. Herrick, Cleveland, Ohio, said:

Mr. President: At the present time, any thought relative to consumption is worthy of attention. If the thought is drawn from clinical experience, as is that of this paper, it comes with the force that commands attention; if it comes only from speculation and theory, it meets speculation and theory from others.

The author accepts the theory of the contagiousness of tuberculosis, and that theory, judging from the literature of to-day, seems to be gaining ground. It must be admitted by those who advocate this theory, that it is rather a sequence of the theory that tuberculosis is caused by the bacillus, rather than a conclusion drawn from clinical experience. The mortality from some form of tuberculous disease varies in different communities at from 10 to 12 per cent. of all deaths. No community, climate or location is exempt from it. Yet no physician, I think, from his clinical experience, can from cases observed, present even a shadow of a ground for the theory of infection. Such would be my decision, were I to review my experience in quite extensive practice for the last thirty years. I should quite as soon speak of the contagious character of pneumonia, inflammation of the brain, or other idiopathic diseases. I have a paper on the modern views of tubercle which I hope to present to this Society, in which I attempt to show that the modern views as to the etiology of tubercle are not established beyond question; further, it appears that the treatment, based upon the theory of a specific cause, does not add any advantage to the patient. Further, I do not believe that tuberculosis finds in climate the most effective line of treatment. The atmosphere is a condition of one of the most elementary and essential functions of the body, viz., respiration. The process of respiration we are quite familiar with. Physiology in detail gives us the changes wrought in the blood by air through the vesicles of the lungs.

The pernicious effect of air must be found in the fact that it is not capable of meeting the wants of respiration, or that there is borne through it some noxious or infecting material which affects the blood deleteriously in its passage through the lungs. The fact, however, that the masses are able to breathe and enjoy with perfect health a certain atmosphere, is *prima facie* evidence that some other function must be looked to for affording the benefit derived. Other factors besides air are essential for healthy life. When the medical profession join in the thoughtless experiment of sending patients to some other climate, warmer or colder, with greater or lower altitude, dry

or moist, with no definite conclusions as to the effect of either high, dry, low or moist atmosphere, I think we are very easily, and I fear thoughtlessly, shifting a hopeless case from our shoulders, a responsibility, with the vague hope, possibly, that good will come. Many are the victims that have sacrificed home comforts, kind friends and everything that would give promise, for the unassuring hopes of a "change of climate."

I have come to regard food as a more important agent in the treatment of consumptives than climate, and if I include appropriate exercise and out-door life, I think we have the most important means at our command for the treatment of this most fatal malady.

Of course, in speaking of food under the head of remedial agencies, I mean such a judicious selection of food as may be digested in the condition of impaired digestive organs and give to the blood all the nutritive material necessary for the restoration of the wasted tissues. In speaking of exercise, I refer to that which is adapted to the condition of the patient; I would emphasize the importance of body exercise in distinction from that of the extremities.

I have often observed the wholesome effect of gardening in certain patients who were manifestly in the incipient stage of consumption. Of course, open air life gives the best air to be had, hence the best element for respiration. In this connection I must express my distrust in all the local means so skillfully used at the present day. It seems to me that the pneumatic cabinet, hot-air inhalations, germicidal inhalants, *et hoc genus omne*, do not afford even a forlorn hope of relief.

I wish to commend the thought of the paper as embodying the personal experience and observations of the author, and trust we may yet have further inquiries in the directions suggested by him.

Dr. John McCurdy, Youngstown, Ohio, said:

I thought when the gentleman started out that he had discovered something new, but I see he has not. I want to take issue with him. I have been practicing medicine thirty-three years, and I do think we have made mighty strides in the treatment of consumption. I do think a

great deal of advice given by physicians in the country is good advice and safe, that is, for the well-being and longevity of our patients. I think about two years was the average length of time a consumptive would live, and we have brought that period up to at least twelve years, and I think if you take the disease in time, it can be averted in three-fourths of the cases. Send your patients to an altitude of seven thousand to nine thousand feet, and keep them there. In many instances recovery will be secured, and, if the patient is kept west of the Mississippi, he may enjoy good health. Continuously, I think we have done a great deal. There is, of course, a certain type of consumption that is destructive. I know I have benefited a good many by telling them to go to Colorado. I think I have benefited a good many by keeping them at home. There are some where the case responds to drugs nicely; others where drugs are of no use, but I think we have done a great deal to lengthen the lives of consumptives.

PRESSURE AS A REMEDIAL AGENT.

BY JOHN McCURDY, M.D., YOUNGSTOWN, OHIO.

I shall only speak of pressure in a restricted sense—as it is used in subduing inflammation and in placing diseased parts in the most favorable condition for a return to their normal state.

In inflammation as it is taught to-day, we have stasis, with the white corpuscles passing through the coats of the capillaries and veins and far out into the surrounding tissues, while the red corpuscles, after passing out, remain in the vicinity of the vessels.

These migrated cells subdivide and new cells are formed, and the tissues into which these cells pass undergo decided changes; some soften, liquefy and disappear; others undergo fatty degeneration, and this débris is carried away by lymphatics or veins, or is mingled with pus. I find no difference in the view that by far the most important pathological change is in the coats of the vessels, that this is what causes the stasis, and not the cells or the blood.

In inflammation of the lymphatic system, changes somewhat similar take place. The tubes become dilated and their coats thicken. Coagulation of their contents takes place and the tube may be obliterated. This coagulation may become organized, or it may soften and suppurate, and this softened and effete mass enter the circulation, and so cause pyemia and septicemia. Pus can be wholly formed from connective tissue, and the proliferation of tissue has a very important share in the

formation of pus. Believing the above to be true, I thought I could relieve stasis by mechanical pressure, greatly restrain or partially cut off the circulation, prevent the proliferation of cells, and greatly reduce the sensibility of the parts.

In support of this view, I cite the following cases:

Case I. Mrs. B., aged 45; ulcer on leg, four and a half inches long, two and a half inches wide; bluish in color, with hard, whitish, cartilaginous border, and from surface exuded a thin, ichorous serum. Very painful, and it was somewhat periodical, the worst paroxysms occurring between 8 and 12 P. M. Appeared anæmic, thin in flesh and feeble, and stated that ulcer was result of wound made by horn of vicious cow twenty-seven years previously, and had never closed from date of injury. Gave iron, quinine and arsenic, applied stimulating antiseptics, covered surface accurately with from ten to twelve thicknesses of cotton cloth, and then, what in my opinion was by far the most important, applied, evenly and tightly, a rubber bandage from toes to knee.

In about four weeks, surface was covered with florid granulations. Then substituted a simple unguent, continued bandage, and in two months from first application, had the gratification of seeing ulcer closed, health greatly re established and pain wholly relieved.

Case II. Mrs. K., aged 35, stated to me that several months previous, an eruption had appeared upon nose and cheeks, that she had persistently taken drugs for the blood and applied all forms of external applications, and but to see the ulcers spread and deepen.

I suspected the eruption specific, and wanted to prescribe what I considered proper remedies, but she begged me not to make her take anything more internally. There was a large ulcer on each alae and two upon one cheek and one upon the other. So repulsive had these

become that she felt compelled to withdraw from society. Being willing to submit to any plan of treatment, I filled each nostril with cotton wool, applied oiled cotton over each ulcer, placed evenly rolled bandage upon sides of nose over ulcers, and thick pledgets over ulcers upon cheeks. Thus I raised above the bridge of nose the dressings, then held them all firmly in place by wrapping rubber cord in successive coils around face and back of neck. Great inconvenience was experienced by this dressing, as patient was compelled night and day to breathe wholly through mouth, but it was borne cheerfully. Dressing removed, ulcers dressed daily, and in a week patient was so delighted with the pale and contracted appearance of ulcers that she ardently continued the pressure. In a little more than three weeks the ulcers were closed, dressings removed, and although more than three years since, face has been, and is, wholly free from disease.

Case III. Mr. B; called to see him for acute inflammation of metatarso-phalangeal articulation of great toe. Cause of trouble obscure. Produced, perhaps, by slight twist. Pain very severe, parts greatly swollen, resulting in great effusion.

Anticipating suppuration, so great was the inflammatory attack, I constantly applied hot and wet applications.

Joint did not suppurate, but result was partially subdued pain, chronic enlargement and partial absorption. This condition continued for five weeks, with constant confinement to house.

Being a business man, this great loss of time was serious. I applied bandage, making all the pressure he could bear, with foot elevated. In twenty-four hours improvement was visible; pressure was continued, and business resumed by placing foot in large shoe with thick sole. A perfect recovery followed.

This was fourteen months ago, and no return of trouble, with normal use of foot.

Case IV. This represents a type very common in my locality, and the opprobrium of every practitioner. I refer to the indurated and chronic swelling of the lymphatic glands of the groin, neck, etc. They are so painful the possessor cannot work, and so low a type of inflammation that suppuration cannot be induced.

Since adopting even and continuous pressure I can now bring about speedy absorption of mass, with cessation of pain, in about three days. The most successful plan in glands of groin is to apply many thicknesses of cotton over induration, then pass a broad rubber bandage around pelvis over dressing, etc., until all the pressure is made that patient can endure, and enjoin the recumbent posture for seventy-two hours. The groin is an awkward place to apply continued and even pressure, and the practitioner must determine to do it well if he adopts this treatment.

On account of the importunities of patients I have allowed some to continue business after adjusting bandage, and have generally been disappointed, as the motions of the body almost certainly displace the bandage.

I have repeatedly treated syphilitic nodes successfully in this way, and one case of periostitis, the sequel of typhoid fever.

I shall say in closing that the various kinds of stuff used for bandages will not do in this plan of treatment. It is but time lost to use any other than rubber. I shall add that if any form of unguent is used, oiled silk or other impervious substance must be placed over it, as its contact with the rubber will dissolve and destroy it.

DISCUSSION.

Dr. H. J. Herrick of Cleveland said:

Mr. President: In the paper read on the remedial effects of pressure, we recognize an old principle in surgery.

The explanation of the therapeutic action of pressure has been that it stimulates the absorption of exuded fluid and also acts to restore the normal circulation of the blood, by supporting and compressing the dilated vessels. With these guiding principles we recognize the fact that certain important indications are met in treatment. Under the guidance of these principles it had been my custom to regard it as applicable only after the active stage of inflammation had passed, when it was supposed to facilitate resolution. In the paper we observe that it is used in the cases reported during the active stage of inflammation. It is claimed that by it the disease was subdued and speedy restoration secured. I can hardly bring the therapeutic effect claimed under the old principles of action. What the action of pressure can be to arrest or limit an active idiopathic inflammation, I am unable to see. Perhaps it secures rest, allays nerve excitability, prevents the vessels from becoming dilated, and thus prevents stasis. I should have excluded its use as inapplicable in the class of cases presented in the paper.

Theory must always explain the fact. Other principles of action may therefore be noted under certain constitutional and local conditions.

It would seem to me, if applicable at all during active inflammations, that it would be in the diffuse varieties, as erysipelas in the type recognized as asthenic. The points, it seems to me, to be noted, therefore, are, in what class of cases it is applicable and during what stage and in what manner it is best applied. It would hardly be claimed that it is applicable in a high grade of inflammatory action of asthenic type, where firm, unyielding tissues are involved; it is generally applicable after the active stage has passed for promoting resolution. It may readily be made to the extremities and testicles by means of elastic bandage or adhesive strips; it may be applied to the breast or surface of the body by means of adhesive plasters or strips, which are now manufactured in such elegant forms as to be adapted to this object. I wish to express a feeling that is constantly arising in my mind, that where any line of treatment is adopted or advised it should be referable to certain principles of action, which may be appreciated as applicable for cor-

recting the disordered physiological function. All treatment, if it would escape the charge of empiricism, must meet this test.

The paper is one worthy the consideration of this Society and I trust further exchange of views may be had.

Dr. McCurdy, in closing the discussion, said:

I am really a good deal at sea as to how far pressure is useful in the treatment of inflammation; but I am satisfied that in certain stages of inflammation it is very important. I believe that the real trouble in all inflammations is the change that takes place in the coats of the vessels, and I believe if we can stop the corpuscles being transmitted, we can bring about a normal condition.

As an illustration of using it in a case of inflammation, I will say that within the last eight weeks I treated a young man with an immense carbuncle on the neck. I felt uneasy about the young man; he belonged to a scrofulous family, and many of his relations had died of consumption. I thought this was a local deposit of tubercle, and I gave him iron and tonics, pushing him along as well as I could. His lips were bluish, pale, and altogether he was in bad shape; his appetite failed him; but, with above treatment, he was able to resume work in six weeks. It was not more than about ten days when he came to see me again, and here was, on the other side of his neck, an immense swelling. It was warm, the tissues were solid, and covered a space of two and a half or three inches across the base. I saw I was going to have a terrible time, and I concluded to try pressure. In the first place, I took pure carbolic acid and soaked a pledget; put the pledget about four double upon this swelling. I then passed a bandage evenly and smoothly over same and also over the edges, as tightly as it could be borne; and I did not allow the bandage touched until he came to my office and I removed it. The result was good: resolution by absorption, without any appearance of abscess and without any bad results. He was away only a few days from his place of business. In fact, he attended to his business, more or less, all the time. I don't say I can tell just the stage when to apply this pressure, but I know it is always safe and proper in the first stages.

TREATMENT OF INJURIES TO THE HEAD.

BY DUDLEY P. ALLEN, M.D., CLEVELAND, OHIO.

Any surgeon familiar with injuries of the head is acquainted with the difficulties which are met in diagnosticating the exact seat of injury and its extent. The differentiation between concussion and compression, though much discussed, has been most unsatisfactory. There is great uncertainty, too, in prognosis, some cases of severe injury resulting in recovery, while in other cases of apparently slight injury, death occurs speedily. There are still other cases which do well for a time, and then die suddenly and unexpectedly.

It is not the purpose of this paper to discuss cases of severe injury, where there are external wounds, together with a fracture and evident depression of the skull. In these there is no doubt of the necessity of surgical interference. We shall speak rather of cases where the diagnosis is doubtful, and consider what plan is to be pursued under such conditions.

As a basis for these considerations, we will state six cases of injury which have recently come under our care. The first will be stated somewhat at length, in order to show the method pursued in treatment and operation:

On September 10, 1888, Mrs. W., aged 39 years, in vigorous health, while standing in a car door, was thrown violently backward by the sudden starting of the train, and struck her head upon the metal arm of a seat.

When I saw the patient for the first time, on November 2, she could not definitely locate the point struck, but placed it at about the median border of the left parietal bone, close to its posterior margin.

Patient was helped out of car and walked a short distance, but soon became dizzy and was compelled to lie down. The same night, some hours later, patient aided in caring for others injured in the same wreck, and the next day took a railroad ride of several hours. During the four weeks following, there was much headache, but patient was up and about. About October 10, the pain increased, and dizziness, which had previously existed, became more marked, so that patient staggered some in walking. From this time patient remained in bed until November 2, when she was brought to Cleveland, about eighty miles, and entered Charity Hospital, under my care. At this time the pain in the head was intense, and patient said she felt as though a nail were pressing upon her brain at the point where she received the injury. The pain was so severe that she threw her head somewhat backward, and seemed to want to bore the occiput into the pillow. Had a constant sensation of falling backward, slept poorly, was greatly depressed in spirits and very nervous. Had previously vomited occasionally, but not recently, but the vomiting may have been due simply to gastric disturbance.

Patient was placed upon iodide and bromide of potash, and later hydrarg. chlorid. corros. was added to these, and they were continued about five weeks, but without any noticeable change. On November 30 a consultation was held, at which Drs. H. K. Cushing, W. J. Scott, Frank Weed, B. L. Millikin, Henry S. Upson and myself were present; and the same gentlemen met again December 7. Dr. Millikin made repeated examinations of the eyes, and Dr. Upson of the various nervous

phenomena. The following are extracts from their examinations:

DR. B. L. MILLIKIN'S REPORT.

11-3-'88. Examination of the Eyes.

O. D., V-6/6.

O. S., V-6/6.

Movement of the eye-balls in all directions normal.

Pupils normal in size and reaction.

The objective field for white shows undoubtedly some peripheral narrowing in both eyes. Eyes very sensitive to light ever since the injury.

The ophthalmoscope shows in O. D. borders of disc slightly hazy, disc and retina somewhat injected, choroidal crescent to outer side of disc, arteries slightly diminished in caliber, veins greatly distended and very tortuous all over the fundus of the eye, from the borders of disc clear out to the periphery, all the veins involved.

O. S. shows disc slightly injected, a little haziness of borders, broad choroidal crescent outward, arteries normal in size, or little diminished in caliber, and veins likewise greatly distended, and tortuous over the entire fundus.

1-2-'89. Fundus of eyes had changed but little since last examination. Perhaps caliber of veins slightly diminished. No haziness of borders of disc of O. D. The pupil of O. S. is now larger than O. D., but both react readily to light and accommodation; vision in both eyes normal.

DR. HENRY S. UPSON'S REPORT.

Examination of Mrs. W., November 3, 1888:

On palpation of head there is a tender spot just to left of median line in the posterior part of the parietal region. There is no paralysis of eye muscles, nor deviation of face or tongue. Patient stands somewhat unsteadily, but there is no loss of power in either arms or legs; grip

is the same on both sides; sensation is acute all over the body, as well to painful as to tactile impressions. The triceps, wrist and knee reflexes are equal on the two sides and well marked, but not exaggerated; there is no ankle clonus. The visual memory is perfectly good; patient can read very well, can recall faces, scenes and colors as well as before the accident; there is no hemiopia.

November 16, 1888. Patient has noticed a weakness of the right side, and has had sharp pains in the right toe and foot. On examination the grip seems distinctly weaker on the right side, and the muscles of the right foot act less energetically; possibly as a result of the pain in that region. There is no change in the reflexes.

December 6, 1888. Patient's condition practically unchanged. Still intense pain at point of injury, and tenderness to pressure. No paralysis nor anæsthesia. Pain in right foot better since last examination; has had some pain in the left foot. Is still rather unsteady when she stands.

To summarize the case, it appeared that an injury to the skull had been followed by severe headache, continued for three months, and that pain and tenderness at the point injured were intense. There was also marked dizziness. Examination of the eyes showed sensitiveness to light and very marked congestion, and tortuosity of the veins, indicating, perhaps, increased intercranial pressure. Examination of the nervous apparatus showed no focal symptoms referable to the cerebrum, unless it were a slight weakness of the right side, which, however, was not positive. There was also pain in the fourth toe of the right foot, later becoming general in ball of foot. This was so severe that patient stepped on foot with difficulty. There were neither chills nor fever accompanying sickness. In spite of appropriate medication and surroundings, patient grew worse rather than better. On this account, and

from the fact that the blow upon the head was just posterior to the leg center of the left side, and that this was accompanied by severe pain in the right foot, and that the marked tortuosity of the retinal vessels indicated increased intercranial pressure, it was decided by the gentlemen in council to trephine at the point of greatest tenderness and pain. On December 13 the operation was performed in the presence of the consulting physicians and several others. On the previous day the bowels were thoroughly cleared by OI. Ricini; the head was shaved and disinfected, and wrapped in a towel wet in bichloride of mercury. A hypodermic injection of morphia, gr. ¼, was administered, and the patient was etherized. A flap three inches wide at base and four inches antero-posteriorly was made down to the periosteum. The base of the flap was toward the occiput. The periosteum was divided by a crucial incision, and the bone exposed. The skull was opened by a Horsley trephine one and three-fourths inches in diameter. The trephine was made for me by Gemrig of Philadelphia.

Since the skull was of an unequal thickness, and about five-sixteenths of an inch thick at one side and thinner on the other, it became impossible to complete the operation with the trephine, since by so doing the brain would have been seriously lacerated at one side before the skull was divided at the other side. It was thus necessary to divide the remaining bone with a small chisel. In doing this the inner table of the skull split off, the slivered part remaining attached to the button of bone, and slanting out under the periphery of the trephined opening; thus the button was removed with much difficulty. But this was finally accomplished without lacerating the brain or its membranes. The button of bone removed was found to be uninjured. The dura-mater bulged quite markedly into

the opening, and fluctuated slightly. This was divided through about two-thirds of its periphery at about one-eighth of an inch distant from edge of bone.

The pia-mater was somewhat congested at the central portion, and lifted from the surface of the brain by an increase of the clear cerebro-spinal fluid. This fluid was evacuated; neither clot nor inflammatory exudations were found, nor was there any depression of the inner table of the skull. The dura-mater was then united by a continuous suture of very fine cat-gut; the bone, which, after its removal, had been kept wrapped in an antiseptic towel, and kept under water at a temperature of 100° Fahrenheit, was returned to its place; the periosteum was drawn together over it by a fine cat-gut suture; a drainage tube was placed under the flap up to the opening in the skull, and the scalp was united and dressed antiseptically. The patient recovered from the anæsthetic rapidly, having endured the operation well, and soon regained consciousness. The dressings soon became quite moist with the escape of cerebro-spinal fluid. A day and a half after the operation the temperature had marked 101.3°, and the pulse 100. Ice-bags were applied, and after this it was impossible to tell whether the moisture of the dressings was due to the escaping cerebro-spinal fluid, or to the moisture from the ice-bags.

On December 17, four days after the operation, the dressings were opened, sutures and drainage tube removed, and wound found in perfect condition. From this time, the progress of case was most satisfactory, and on December 28 patient sat up for first time. The union of the wound was by first intention throughout, and without a single drop of discharge. On January 6 patient walked down hospital stairs, a long and difficult flight, and on January 18 went to her home.

Since that time her progress toward recovery has been continuous.

After the patient's return home her left pupil was considerably more dilated than the right. On April 18 her husband writes, "The left pupil is dilated some at times, though not near so much as a few weeks ago. Within a week past I have seen more improvement than in any three or four previous. I think the trouble in the back of the head is entirely relieved." "There is still some frontal headache when she exercises too much, and the eyes are weak, as she cannot read very much."

About four and a half months have elapsed since the operation, and there is very marked improvement. Sufficient time has not elapsed to determine definitely the result of the case.

This case is one of six that have recently come under our notice, in which severe blows upon the head had been received. In none of them was there evidence of injury to the skull externally.

A second case I saw about five weeks after the receipt of his injury. During the last four weeks the patient had had convulsions, and laterally high fever, and was comatose. I trephined. There was no depression externally, but a small piece of the internal table of the upper margin of the left parietal bone penetrated the membrane of the brain, and in the substance of the brain was an abscess containing about two ounces of pus. The case terminated fatally about one week later, the case being well-nigh hopeless at the time of operation. The clinical evidence of the case would have dictated an operation on the third day following the accident.

The third case was of a man struck upon the vertex of the cranium by a shaft, but not rendered senseless. He continued at work for about ten days. I saw the patient five weeks after receipt of injury. He was then comatose,

and had impaired motion of right side. Patient died one week later. The brain was removed before I had an opportunity to examine it, but was said to show no lesion which could be seen macroscopically. I examined the skull carefully, and it appeared normal in all respects.

The fourth case was of a man who fell from a second story window. Was unconscious for a few moments only, after which time he walked upstairs. There was considerable nosebleed, and a fracture apparent of the nasal bones. During night of injury was delirious for a few hours, but later suffered little pain, and was about the house after nine days, and three weeks from date of injury went to work regularly. During succeeding eight weeks patient was twice delirious and unconscious, but between these attacks he worked. About ten weeks from time of injury patient was brought to hospital, when I saw him for the first time. He was then unconscious and had stertorous breathing. It was 11 P. M., and I operated at once, since condition admitted of no delay. Trephined frontal bone of right side just above frontal sinus. The skull was cracked vertically at the frontal bone. No depression of inner table could be found. The membranes were injected, but no collection of pus was discovered, either externally or by puncturing substance of brain deeply with a scalpel. Patient's condition did not improve and he died thirty-six hours after operation. The autopsy showed a diffuse meningitis with a small amount of pus under the pia-mater. A small piece of bone just to the right of the crista galli was fractured and depressed outwardly

The fifth case was of a man injured by falling from a car about fifteen years ago, and striking on head just over right eye. Was in hospital a short time. Remained well until November, 1885, when he began to be drowsy and lose his memory. On December 8, 1886, had his

first epileptiform seizure, after which he became unusually stupid. Case seemed hopeless without an operation, and on January 8 I was asked to operate, which I did, at the seat of old injury. A trephine one inch in diameter was used. Nothing abnormal was found. Button of bone was not returned. Wound healed by first intention. Patient got up from operation slowly. Three months later had two convulsions. Did not walk without crutches for a year. At this time resumed trade of a watch-maker, and did his work all right, but was forgetful. Later had attacks of weakness, and two years from time of operation patient died. At autopsy the opening made by the trephine was about half closed by bone and fully covered by periosteum. The inner table of the skull was normal. Effusion into the pia-mater was quite marked over whole surface of brain; at many places it was stained red. Brain substance and medulla appeared normal. The microscope showed serous and bloody effusion into the pia-mater very marked, with congestion of the meninges.

The sixth case was of a man who, three years before, and again three months later, received severe blows on right side of head. He recovered rapidly in the first instance, going to work in a few days, and in the latter, on the same day as the injury. Since this time has occasional clonic spasms, which are slight. Worked most of the time until about five months ago, since which time he has been unable to do so. Recently has grown much worse. Spasms and convulsions are more frequent. Is very slow and uncertain in all motions and mental processes. Walks with great difficulty, and during last week seems to have a tendency to fall backward. A possibly slight dragging of left foot. No other distinct focal symptoms discovered by most careful examination.

Ophthalmoscopic examination by Dr. Millikin showed marked optic neuritis of both eyes, with considerable

swelling of the discs and several small hemorrhages. Papillary reactions normal. Vision of right eye 3/30, and of left 6/6. (?)

During the week the patient was in hospital his condition grew rapidly worse. Convulsions were more frequent and more prolonged. It became evident that anything which was done must be done at once. The history of a blow upon the right side and the slight dragging of the left foot determined the operation over the leg center on the right side. Two buttons of bone were removed by a three-fourths inch trephine, and the opening was elongated antero-posteriorly by a rougeur. The pulse, at the beginning of the operation, was 160, and there was considerable cyanosis. The membranes bulged strongly into the opening and were congested. The convolutions were much flattened and anæmic. The finger was carried an inch outward from the opening in the skull in all directions, but nothing abnormal could be felt. A scalpel, carried one and one-half inches into the substance of the brain, gave no information. The dura-mater was united with great difficulty, owing to the great bulging of brain. Patient died about thirty-six hours after operation. At the autopsy a grayish mass, one and one-half inches in diameter, was found four inches posterior to gabella of nose and two and one-half inches right of median line, and just anterior to the point touched by the finger in operating. Under microscope this presented the appearance of a glioma.

It may not be unprofitable in closing this paper to point out certain features peculiar to each of the cases mentioned.

The first case was reported at length, to show the difficulties incident to a diagnosis of a case and also the great care requisite for operation. It is very remarkable too, that a button of bone one and three-fourths inches

in diameter should be removed from the skull for nearly half an hour, be replaced, and grow firmly into its place, without an unfavorable symptom of any sort. It is such cases as this which decrease one's fears in operation upon the brain.

Case II. is one which probably might have been saved by any early operation. There was a convulsion on the third day following the injury, and other symptoms indicating the necessity of immediate interference. The accompanying specimen shows a crack in the external table of the skull and the depressed spicula of bone from the internal table.

Cases III. and IV. are illustrations of the fact that apparently slight injuries to the skull, not so severe as to prevent the patient's working, may after a few weeks result fatally. The accompanying button of bone, taken from one of these cases, illustrates how the skull may be cracked and still no depression of bone occur.

Case V. suggests that injuries may result in epilepsy. That this is true seems now to be a fact well established, as illustrated by the relief secured in certain cases of epilepsy by trephining.

Case VI. suggests that cerebral tumors may result from injury. Whether this is so or not can only be established by numerous observations. The importance of rest after injuries to the head is very great. It is not improbable that Cases III. and IV. might have recovered had they remained quiet after being injured. A good deal might be said about methods of operating and instruments. Of the necessity of strict antisepsis there can, I think, be no question. By no other method could we expect to remove, and again replace, portions of the skull, and have them grow in place successfully.

As to instruments, the large "Horsley" trephine, which I show you here, one and three-fourths inches

in diameter, has the advantage that it opens a large field for work, and that the single piece of bone thus removed can be replaced more easily than several smaller pieces. It is, however, a very unsatisfactory instrument to use, for several reasons. If the skull were flat and of uniform thickness, there would be but little difficulty. This, unfortunately, is not the case, and as a result the trephine cuts through the skull at one point, and is liable to wound the brain before the skull is divided elsewhere. If an attempt be made to avoid this by tipping the trephine, it binds so closely in the cut that it is impossible to turn it.

This might be remedied to a certain extent by making the trephine conical, and the cutting grooves on the periphery of the trephine deeper and slanting, as in the small trephine which I show you here. It has been suggested to me that a trephine might be constructed, consisting of a segment of a circle, which might be used to cut at any portion desired. I have operated with quite a variety of trephines, and find the conical instrument, with deeply grooved sides, by far the most convenient. Several openings can be made with this if required, and the opening enlarged to any extent desired by the rougeurs, which I show you here. I have used a chisel in working on the skull, but a serious objection to it is that it is liable to split the inner table.

The question of diagnosis of cerebral lesions is an extremely complicated one, and it is not within the province of this paper to consider it. Though it must be impossible to determine the exact nature of many injuries, much can be done by a careful observation of symptoms, together with observation of the retina for indications of intra-cranial pressure, of the seat of injury, the character of the blow upon the skull and the possible manifestation of focal symptoms. In these observations the surgeon

may receive valuable assistance from the oculist and neurologist.

In each of the operations mentioned, ether was used and was wholly satisfactory as an anæsthetic.

In conclusion, we would insist upon the fact that injuries to the head, though apparently slight, may be of serious import, and that fatal results may be averted by prolonged quiet.

We would also state our belief that in skillful hands and with modern methods the dangers of operations upon the cranium have been greatly diminished, and that timely interference will save many cases of injury to the skull which have formerly been left to nature and resulted fatally.

TREPHINING.

BY GEO. GOODHUE, M.D., DAYTON, OHIO.

The art of trephining has been practiced for a long time, at first, however, in a somewhat rude way, but like all other branches of surgery, it has had its share of thought bestowed upon it until it seems to have reached a point so near perfection, that of late years very few changes have been advocated in regard to method of operation.

Some difference of opinion still exists in reference to detail, the form of scalp incision, the employment of antiseptics, the manner of drainage and dressings, and the form and size of trephine best calculated to give the most favorable results, as well as the advisability of replacing the button of bone removed.

But the chief question to-day which meets us as practical surgeons, and where difference of opinion arises, is the propriety or necessity of operation.

Epilepsy seeks relief at our hands occasionally, and is there sufficient hope of success to warrant the danger of trephining, is sometimes a matter difficult to determine. Injuries occur that give some symptoms of brain compression, and shall we trephine, is a question involving the interest as well as danger, both of the patient and surgeon; and sometimes *it* is a knotty problem to solve.

Three such cases have presented themselves to me during the past three months, one of which seemed likely, for a time, to appear in court, for a jury of unskilled and perhaps ignorant men to decide whether or not a surgeon of

some prominence was guilty of malpractice by omitting the use of the trephine.

The first case was brought to me February 20, 1889. The patient was a little girl ten years old, well nourished, and peculiarly bright and intelligent.

In September, 1886, she fell through an overschute of a bank barn, a distance of eight feet, sustaining a fracture of the clavicle and of the skull over the right parietal region.

She lay in a comatose condition tweny-four hours, and in an unconscious state forty-eight hours. She made a slow recovery, being confined to her bed one month.

So far as I can learn, although the fracture of the skull was observed, no special attention was paid it, and assurances given that it would not interfere in the least with perfect recovery.

In a few months she regained perfect health, with the exception of severe headaches, that occurred at intervals of a week or two. She suffered no other inconvenience for a little over two years, when, in November, 1888, she began to complain of her left side feeling cold.

In January, 1889, were first noticed signs of paralytic trouble affecting the whole of the left side and face. She had now fallen into the hands of a thoroughly competent physician, Dr. J. A. Romspert, through whose advice I was called in consultation.

When she was brought to my office, February 20, 1889, she was unable to walk on account of paresis of the left leg, or to raise her left hand to her head, although she could move both the hand and foot a little. All the muscles on the left side of her face were paralyzed to such an extent that the saliva flowed more or less constantly from the corner of her mouth, and in drinking milk, great care was necessary to prevent its escape.

There was, perhaps, slight anæsthesia of the left side, but it was not well marked. She generally voided her urine

and fæces involuntarily. The depression of the skull and scalp over the right parietal region was so great that it could easily be recognized fifteen feet away. I advised trephining immediately, and with the assistance of Drs. J. A. Romspert and J. S. Beck, I operated February 25, 1889.

The scalp was turned back and a large trephine applied to the centre of the depression. The opening thus made was enlarged by means of the bone forceps, until all the bone involved in the depression was removed. The duramater was exposed to the extent of an inch and a half in a perpendicular direction, and two inches in a horizontal, extending over both sides of the fissure of Rolando.

The operation was done under strict antisepsis, and as no fever of consequence developed, the primary dressing was allowed to remain until March 3, when the wound was found completely healed except in the immediate vicinity of the drainage tube. At the end of the first week after the operation she had regained control over her urine and fæces, and with the exception of a few times she has had no difficulty in this direction since.

The distortion of the face grew less, but is sometimes for a few days nearly as great as ever, when it again grows better. The paralysis of upper and lower extremities, which had been advancing quite rapidly previous to the operation, ceased to progress, but as yet shows no sign of improvement. Her mind, which was peculiarly bright at the time of the operation, has shown signs of failure during the past six weeks, and although her appetite and digestion are perfect and her body well nourished, there seems to be a progress of the malady in some of the brain centres, upon which depend intellectuality and self-control, which makes the prognosis bad and raises the question whether or not a further operation is indicated.

Case II was that of a young man twenty-one years of age, peculiarly healthy, powerful and tough. On March 15,

1889, in a drunken row, a friend struck him on the head with a hatchet, rendering him unconscious, in which condition he lay for thirty-six hours. A surgeon was immediately summoned, who diagnosticated his case as that of fracture of frontal bone, with compression, and advised operation.

A second surgeon was called, who considered his case as that of concussion alone, and treated him for two weeks. When, after thirty-six hours, he began to regain consciousness, he considered his diagnosis verified. By the fifth day he had recovered sufficiently to be about the house, and on the eighth day after the injury he walked half a mile to the mayor's office and gave testimony against his assailant. On the next day he became worse and returned to his bed, and was more or less unconscious until the fourteenth day, and during the fifteenth and sixteenth was entirely oblivious to the outside world.

On the fifteenth day, Police Surgeon P. N. Adams was called, and decided that in trephining lay his only hope, and on the sixteenth day after the injury, called me to perform the operation. I found him with a temperature of 104° and a pulse of 140, with no history of chills. None of his muscles were paralyzed, but when touched he would move his limbs and seemed in a somewhat hyperæsthetic condition. He passed his urine and fæces involuntarily.

Fracture, with depression of the frontal bone over the superior and middle frontal lobes of the brain on the left side, was easily detected. Trephining, with strict antiseptic precautions, was immediately determined upon. On turning back the scalp, a piece of bone a little larger than, and the same shape as, the head of the hatchet was found comminuted and driven down so that the external surface of the depressed bone was on the same plane as the internal surface of the undisturbed skull. The trephine was applied just posterior to the injury and all the broken bone

removed. I then discovered a drop of pus issuing through a minute opening in the dura-mater, and upon slight pressure several more followed. I then enlarged the opening in the membranes and exposed the brain itself, and found that the abscess was located in the cerebral tissue. The pus fairly gushed from the cerebral opening, and we estimated the amount evacuated to be at least three ounces. The cavity was very carefully and persistently washed with a bichloride solution. The portion of the scalp-flap just over the injury, which was in a bruised and filthy and almost sloughing condition, was removed. Two drainage tubes were introduced, one passing beneath the scalp in its most dependent position and the other inserted into the abscess cavity and protruding through the opening made in the scalp-flap. As soon as he had recovered from the anæsthetic, and before we had completed the washing of the instruments, he was in a perfectly conscious state and would answer all questions intelligently.

We expected, however, a fatal issue and gave a very guarded prognosis. The subsequent discharge was but trifling, the tendency to cerebral hernia but slight and easily controlled by pressure, and his recovery was uninterrupted and rapid. He was operated on March 30, 1889; within a week he was walking about the house, and on April 25 his wound was completely healed. He now suffers no inconvenience, his mind is not impaired, and he has joined the ranks of the Prohibition party.

Case III. Patient was a young lady eighteen years of age, who on May 14, 1889, jumped from a buggy drawn by a runaway horse. She struck upon her feet and rebounded, striking her head with great violence upon the smooth sand of the road-side. I first saw her May 16, 1889, forty-eight hours after the injury. She had been unconscious from the first, with slow pulse and deep, heavy respiration, and vomited occasionally during the

first day. I found her with a very feeble pulse that had increased from 105 in the morning to 150 in the middle of the afternoon. The temperature was very high. One pupil was dilated and she was passing urine and fæces involuntarily. No other muscles were paralyzed. She was in a state of great muscular excitement and in almost constant motion. The scalp was bruised and swollen, but not lacerated. The sensation of touch revealed no sign of fracture, but her symptoms gave conclusive evidence of compression from some cause, and she was so rapidly sinking that we felt justified in making at least an exploratory incision in the hope that, perchance, some new light might dawn upon us that would enable us to afford our patient relief.

Her pulse was so feeble and her condition so precarious that we informed the family that she might die on the table, and that we should operate merely to give her the benefit of the only ray of hope remaining.

A large horse-shoe flap was made on the left side of the head and a long fracture found, extending anteriorly and posteriorly beyond the limits of the skull thus bared. These limits were extended until both ends of the fracture could be observed. It began anteriorly in the coronal suture, an inch below the commencement of the sagital suture; extended almost to the inferior end of the coronal suture and in a somewhat irregular line across the left parietal bone to the lambdoid suture, and ended in this suture about two inches above the point of entrance. Immediately upon laying bare the skull two or three ounces of venous blood gushed from the fracture, and the patient seemed alarmingly weak and we feared immediate death; but she rallied somewhat, and we proceeded to elevate the skull, which was slightly depressed all along the line.

This was accomplished with rather more than ordinary

difficulty, because so much of the fracture lay along the line of sutures, whose edges were more or less serrated. The hemorrhage, while rather free, was not so abundant as we often find it. After it had entirely ceased, the wound was sewed up, stimulants, which had been administered hypodermically during the operation, were renewed and hot water enemeta given. But the patient sank, respiration failing first. And although artificial respiration was kept up for a long time, she died in about half an hour after the completion of the operation.

These three cases present many points of interest to the practical physician, as well as surgeon. The family physician is generally called in cases of injury of this kind, whether he be a surgeon or not, and responsibility for immediate operation or delay is naturally thrown upon his shoulders. Each one of these cases teaches a lesson. They all come under the head of delayed operations. The first involved a delay of over two years; the second, sixteen days; the third, two days. If early operation had been performed in the first case, it is altogether probable that there would have been prompt and permanent recovery. By the delay, secondary lesions occurred in the brain which the late operation failed to reach, only relieving some of the more distressing symptoms; and the result will be the sacrifice of a bright and promising life. I censure no one for this delay, for she soon began to show signs of improvement, slow, to be sure, yet in the right direction; and we too might have been led to practice conservative surgery.

This case teaches us the lesson that a child will tolerate compression of the brain, which, as he grows older, may cause trouble, and perhaps death.

The fracture in the second case was capable of easy demonstration by physical examination, and delay brought him near death's door and subjected him to the

dangers attending cerebral abscess. Considering the extreme exhaustion in this case, and the complication in way of abscess, we may draw the lesson that it is never too late to attempt to save the life of such a patient by the use of the trephine, however small the ray of hope may seem.

Acting upon this thought, I advised operation in the third case, which before the operation seemed as likely to result favorably as the second. The delay of two days I think ill-advised, yet with such an extensive fracture, with the brain evidently lacerated, death was inevitable, whether the operation had been performed sooner or later. The mortality depending upon the operation of trephining *per se*, since the introduction of antiseptics, has been so greatly reduced, that our sins of omission in this department of surgery far outweigh those of commission.

The subject of localization of cerebral function has of recent years been investigated by our best minds, and results ascertained that are sufficiently accurate to be of practical importance. Especially is this true of centres of motion, for disturbances there produce phenomena far more easily recognized than in the intellectual centres, that vary so much in kind and intensity with different individuals. According to our present knowledge of the subject, the centres of voluntary motion of muscles of the face and extremities are situated almost entirely in the ascending frontal and ascending parietal convolutions; while the centres of intellect, reason and self-control are chiefly located in the first and second frontal convolutions.

These conclusions have been reached by analyzing a large number of cases of cortical lesions of the brain, and each new case adds its own little weight toward verifying or disproving the accepted opinions.

In the first case, we had paralysis of the whole left

side, and, according to our generally accepted theory, we ought to have found some lesion on the right side, situated over as well as front and back of the fissure of Rolando. There was a deep and extensive depression of the skull exactly over that region. In the second case, only the first and second frontal convolutions were injured, and here, in accordance with the rule before stated, we had voluntary muscular motions unimpaired, but the reason and intellect were entirely dethroned.

Each year more light dawns upon this subject; and ere long I trust we shall entirely discard the old rule of applying the trephine without any fixed law, each case being a law unto itself, and supply in its place a new law, established on a scientific basis, which shall enable us to apply our instrument with a fixed and certain purpose in our mind, and in accordance with formulated rules.

DISCUSSION.

Dr. John McCurdy, Youngstown, Ohio, said:

I like the tenor of both of these papers. The results have been far from encouraging, but we are still, I think, working on the right line. Two sets of doctrines have existed for a good while, one teaching that the brain should not be touched, let nature take care of herself and all this, and the other urging what seemed to be the extensive use of the trephine. Now, I want to say, as a general practitioner, I have trephined very often; I never used the trephine where I afterward regretted so doing. I never saw the experiment of lifting the skull off the brain that produced an effect I felt sorry for afterward, but I also have frequently followed the conservative course. I shall sit down after I state a case that occurred in my practice sometime ago. A young man came to my office, said he wanted to be operated on, said he was suffering with epileptic fits, said that these fits made him insane and he was afraid he would kill his aged father and mother. I wanted to know what caused this trouble; he said his father and mother told him when

he was a boy he had been kicked in the head by a horse, but he could not tell on which side of the head. The young man insisted I should operate. I told him I would not operate until I found some place to operate on, and I found a depression on the side of the head. I said, Now you will take all the responsibility; I shall lay bare the bone and find what is the cause of this depression. He was willing I should do so. The operation was performed and I found the dura-mater torn and absorbed, I found small spicula of bone around the edge of the depressed portion and the brain pressing up against them. I removed all this portion of the bone, did not treat it very antiseptically. The fact of the matter is, I am sorry to say I could not keep track of the case afterwards. I kept track of the case as long as I could, which was nearly three months. He had three slight epileptic seizures during this time. The recovery was perfect, as I was informed. And I want to say, this is one case where trephining was successful, and I have had other cases of depression where I at once lifted the bone pressing upon the brain to the proper position and had good recovery.

Dr. Herrick:—How long after the injury?

Dr. McCurdy:—As near as I could determine from his father, from fifteen to seventeen years.

Remarks by A. W. Ridenour, Massillon, Ohio:

My object in rising is one mainly of getting information. Why were not anæsthetics used in the case reported? Is it necessary to replace the button of bone removed, especially where the button is not large? It might, in my opinion, be necessary, where the trephine was as large as the large one exhibited by the author of the paper read here this morning. It is impossible for me to conceive the necessity of using one so large by half. Have never replaced the button of bone; never used the large trephine; had no occasion to do so. Operated some sixteen times without any deaths; no inconvenience followed; found a thick cartilaginous growth took the place of the small button removed, and consider it the best. Should think there was more risk of non-union where bone was replaced than even to the contrary, notwithstanding.

Touching the remarks by the gentleman from Cincinnati on my left, would relate a case of injury to "optic" nerve from crushing of ethnoidal bone, orbital plate of frontal, and including supra-orbital ridge. Found "optic" nerve cut entirely through. Patient blind. The trephining did not restore sight. Have trephined where no visible depression existed, simply a "fissure" in external plate, but found internal plate fractured, with sharp spicula of bone penetrating the convolutions. I remember one case, little boy, who, in falling from a chestnut tree, fractured the occipital and loosened the lambdoidal sutures, so that the occiput was movable; at the junction of the occipital with parietal there was a slight depression, with *badly shattered* internal plate; recovery followed trephining. Think *all* cases of injury to brain, followed by coma, or even semi-coma, and where you can locate the *exact point* of injury, should be trephined. Many lives would be saved, many epileptics prevented, by a little *care* in diagnosis and *boldness* in operating. Don't wait too long. The same rule applies to trephining the *spine*. *Don't wait.*

Dr. Starling Loving of Columbus said:

In the criminal court at Hartford, Connecticut, there is to-day, or will be to-morrow, a case on trial in which the subject under discussion is involved.

On a day last fall, after midnight, two young men, both intoxicated, met on the street, got into a quarrel and soon came to blows. The one struck the other on the left side of the head, near, but a little in front of, the parietal eminence, with the larger blade of his pocket-knife, and in the fear that he had inflicted a grave injury, immediately ran away. Within an hour afterwards, the police found the wounded man lying under a tree by the side of the street, at some distance from the spot where the fracas occurred, in a state of profound coma. They promptly conveyed him to the City hospital, where an anæsthetic, chloroform or ether, was administered (I do not know why), and the operation for trephining performed. The operators found that the knife had penetrated the scalp and the outer table of the skull only; that the inner table was intact and the membranes of the

brain uninjured. The dura-mater was cut, but no clot was found underneath, and the cerebral surface was normal, yet the symptoms were those of great and increasing pressure, which had in no degree been diminished by the operation. On the contrary, the stupor became more profound, and within thirty hours from the reception of the wound, the patient died.

The autopsy showed the brain in the vicinity of the injury and of the operation to be in a healthy state. There was no clot nor other evidence of hurt except what had been done by the surgeons—nothing in that region to account for the stupor and the death of the man; but far away from the seat of the stab and of the operation, in the superior and middle portion of the left middle lobe of the brain, and in the left lateral ventricle, was a large clot of blood, evidently the cause of all that had occurred.

Now in this case, localization, reasoning from what we read of it and from what we have heard here, should have been of assistance, but it was not, and I doubt whether, if it had been used to the fullest extent, it could have guided the operating surgeons in the least degree.

I would like to know the medico-legal relations of the surgeons concerned to the case, and how, since the defence claims that the doctors killed the man by the use of the trephine, they (those doctors) are to get out.

Dr. C. W. Tangeman, Cincinnati, Ohio, said:

Relative to the cases just reported by the essayist, there are a few important questions that might be asked the surgeon. First, Of what value is the ophthalmoscope in the diagnosis of these cases or in localizing the seat of injury? Is it of any importance in making a prognosis? The oculist is not so situated as to follow up these cases from the time of injury to recovery or death and the post-mortem table. It is my opinion that many surgeons place too much value on this instrument. It seldom or never occurs that a patient's acuteness of vision is known prior to injury, therefore an examination in this respect cannot be of any value after the injury. Congestion of the retinal vessels, unless it amounts to absolute stasis, is an overestimated symptom. True, in a fracture of the orbital wall

where a spicula of bone encroaches on the nerve, or where in the reparative process of the fracture pressure is made on the nerve, symptoms will develop that can be recognized with the ophthalmoscope by looking at the ocular end of the optic nerve. Again, a brain tumor, especially when situated near to the optic tracts, may produce eye symptoms, but because these symptoms are absent is no sign that there is no brain tumor. Cases have been reported in which the most marked choked discs and death were caused by a tumor the size of a cherry, while on the other hand coarse brain lesions, or a tumor the size of a hen's egg, may not produce any symptoms on the part of the eye. In the first case reported the essayist speaks of an engorgement of the retinal vessels with a diminution of vision. In this instance the patient recovered, but the diminution or loss of vision did not recover. What must we infer from this? Only one thing, namely: that the patient did not see well prior to the accident.

In some of the other cases reported, where the post-mortem examination showed positive brain lesion, there were no eye symptoms to be found. Eye symptoms coming on immediately after an injury to the brain or head, when taken together with other symptoms, may be of some value, but they do not mean anything positively by themselves.

There are many cases on record of fracture of the base of the skull, fracture of the sphenoid bone through the optic foramen, where there were no eye symptoms present to indicate the lesion. My opinion in this matter is that in these cases where there is a slight depression of bone, the eye does not suffer in consequence of the depression. If there are eye symptoms they are caused in some other manner. The fact that eye symptoms are absent when all the other signs indicate fracture and depression, is of little importance, while when they are present it is only another link in the chain of evidence. Of all the cases that I have had the privilege to examine (that come under the same class as reported by the essayist) I have never found one with eye symptoms referable to the injury to the head.

Dr. S. S. Thorn of Toledo said:

Mr. President: These cases as given are such as usually receive what is ordinarily called conservative treatment. Dr. John B. Roberts of Philadelphia, in his little work upon operative surgery of the brain, says: "I quote from Maury, that the serious effects from skull injuries are not so much the result of depression as of the inflammatory conditions that come from the injury." I have for many years felt that the chronic irritations following these injuries were most to be feared and provided against, and have always advised active interference when there were the slightest early symptoms of cerebral injury. I do not fear operation; the fatality from trephining is surprisingly low, not more serious than the removal of a thumb. In my observation, I have learned that erysipelas, even under the old means, is exceedingly rare, and am loth to believe a patient ever dies because of the use of the trephine, but that when death follows it is because of the condition of things making trephining necessary. With these convictions you will readily understand why I recommend, as I do, in every instance wherever there are any symptoms following an injury, that the trephine be applied. This is a strong diet, Mr. President, but I am fully convinced that experience in these cases will sustain all I say. Had the operation been done in these cases early, I believe that every patient would have survived and have been saved the distressing consequences of chronic trauma, that have been so clearly presented in these two papers.

PERSONAL REMINISCENCES OF THE SUBJECT OF ANÆSTHESIA.

BY H. CULBERTSON, M.D., ZANESVILLE, O., ASSISTANT SURGEON U. S. ARMY, RETIRED.

Reminiscences of experiments made and conclusions drawn in 1861 as to how chloroform produces death.

The article concerning this subject was read before the "Ohio State Medical Society" twenty-eight years ago, and published in its 'Transactions' for 1861. The views expressed then hold good to-day. The cry then was "heart failure." Our article refuted this view and advocated brain failure as the death-cause from chloroform. We found the lungs failed first, the heart last, invariably by inhalation; that restoration could be effected when the lungs had ceased to act, but this could not be accomplished after the heart had ceased to beat; that if ether were the inhalant the animal could be restored, even after the heart had ceased to beat, by artificial respiration and electricity (galvanism); we also found that immediate post-mortem examinations revealed the lungs fully expanded until the chest was opened, which caused these organs to collapse one-half to three-fourths, and yet, when shrunken, were engorged with blood, and contained mucus, and bled freely on being incised and crepitated, and floated on water; that the heart and its great vessels were distended with dark fluid, uncoagulated blood invariably fuller on the right side of this organ; that when the heart was opened the right ventricle and auricle contracted, but not the left side of

this organ; that the coronary veins were distended with blood; that the membranes of the brain were congested, but not the substance of that organ, and likewise the vessels of the spinal membranes were distended with blood, but not those of the cord; that the trachea and mouth contained frothy mucus; that the abdominal organs and vessels were turgid with blood; that the left lung was generally more congested than the right; that during the exhibition of chloroform there was, first, excitement of body, free flow of saliva, quickened pulse, contracted pupils, slowing of pulse and respiration, stupor, insensibility, finally thready and more rapid pulse and more frequent respiration, dilated pupils, and the lungs ceased and then the heart to act; that there were reflex spasms of muscles before death, and after death, often, on cutting muscles in opening the chest; that chloroform (1 drachm) injected into the external jugular vein caused distension of all the heart cavities with coagulated blood; that the lungs ceased to act before the heart; that the endocardium was a bright pink color, not dark, as from chloroform inhalation; that both lungs were congested greatly, affording mucus and blood on section; the lungs were expanded, but when chest was opened they collapsed, but not so much as from inhalation; that a drachm of chloroform gently placed about the medulla oblongata caused respiration to cease at thirty and the heart to cease beating at forty-five minutes; the brain and its membranes were found to be injected on the right and pale on the left side, and its ventricles contained but little serum, and the injection was very faint in the region of the Corpus Callosum; lungs collapsed after chest was opened; incision of these organs gave blood and mucus, more on the left side; the heart cavities were full but not distended; that when the chloroform was given by the stomach, there was insensibility; anæsthesia and death followed, and the lungs ceased to act before the heart; the

brain was congested, most so in its cortex; the sinuses were full of dark blood; there was no effusion of serum; the stomach and bowels were pale; the liver was congested and dark red in color; the lungs collapsed when chest was opened, the right dark, the left light red in color; the right on incision gave very little blood or mucus, the left blood and mucus freely; that oxygen, gas and air were by bellows introduced by an opening in the trachea and artificial respiration failed to restore the subjects; that when the animal was killed by pithing the medulla, the lungs collapsed after the chest was opened and were pale, and more blood flowed by incision of the left lung, and the cavities of the heart were full but not distended; that it was found that chloroform did not injure the red globules of blood so as to impair their functions; that it was concluded that chloroform first induced unconsciousness by impressing the cerebrum, then insensibility from its impress upon the sensory ganglia, then the spinal centres and respiratory and heart centres were paralyzed, as well as the sympathetic ganglia and centres, and death followed from paralysis of the affection of the medulla.

These are the main facts reported in my paper of 1861. In twenty-eight years there have been many advances in physiology and therapeutics, and to some of these we would now refer, and through these ask, How is the heart related to the subject of chloroform anæsthesia? As is well known, this organ has an inhibitory centre situated in the inter-auricular septum and connected with the pneumogastric nerves with the inhibitory centre in the medulla oblongata; impressions on these slow the heart, and those from chloroform may paralyze the action of these centres, either in medulla or heart centres, and in either case increase the rapidity of the heart's action. Observation elsewhere and in our experiments also shows that in the final and fatal stages of chloroform anæsthesia both respiration and heart

action become accelerated, and more and more feeble, we have, from paralysis of these centres.

These experiments have also shown that often the right auricle and ventricle, as well as striated muscles, although anæsthetized, have not entirely lost their irritability, and these heart-walls contract, and the striated muscles also, on being incised. But there is no record of contraction of the left auricle or ventricle after death from chloroform, and I have only yesterday found that after the heart and lungs had ceased to beat, and on exposure of the heart, that the left heart could not be made to contract by incision or induced electricity applied to its walls. The left side of this organ seems to have lost its irritability, while that of the right heart is greatly impaired. The laws of circulation would indicate the left heart most anæsthetized.

The following table shows that in chloroform anæsthesia the relative weight of blood in the lungs to that in the heart was increased, and that in death from pithing the medulla the relation was reversed:

In 4 cases	chloroform inhalation,	heart ratio	=1	to lungs	1.74
" 1 case	" on brain,	"	"	=1 " "	1.20
" 1 "	" by stomach,	"	"	=1 " "	1.15
" 1 "	" by jugular vein,	"	"	=1 " "	1.20
" 1 "	pithing medulla,	"	"	=1.28 "	1.00

Thus, without the paralyzing influence of chloroform on heart or lungs or medulla, pithing induces a greater relative weight of heart and its contained blood than of the lungs. Of course pithing is a form of death by paralysis of the brain centres acting on both heart and lungs, without any local paralysis of lungs or heart by anæsthetics. It is probable, therefore, that this anæsthetic increases the relative amount of blood in the lungs, and hence respiration is more impressed than the heart, from lung paralysis.

But there is, as is well known now, excito-motor nerves

and centres in the medulla and heart. The former, it is thought, probably end in the excito-motor ganglia of the heart, situated in the septum of the left auricle and ventricle of the dilated end of the inferior vena cava. The chloroform, paralyzing these nerves either at the centres or through the nerves peripherally in the lungs and heart, would lead to retardation of heart and lung action. But the chloroform paralyzes both the excito and inhibitory centers and nerves, and so death may result.

But a conclusion should not be drawn until the influence of the vaso-motor nerves upon this death process is considered. According to Huizinga (see 'Action of Medicines,' by Isaac Ott, M.D., page 68, 1878), there are nerves acting on blood-vessels as follows:

"Ganglia in or about the walls of capillaries, regulating their calibre."

"Spinal vaso-constrictor nerves [illegible] in the arterial walls."

"Spinal nerve fibres [illegible] ganglia, vaso-dilatory fibres."

"Inhibitory fibres from the [illegible] in their vicinity."

"Irritation of the [illegible] of the capillaries through the inhibitory fibres, or [illegible] the vaso-constrictor fibres.

"The vaso-motor and vaso-constrictor fibres change from the spinal cord through the spinal nerves. The vaso-motor fibres are [illegible] the brain. In extent vary [illegible] of the subcutaneous [illegible] within four or five millimetres of the [illegible] in its lower limit. From the vaso-constrictor fibres arise and pass down the spinal cord and through spinal nerves and sympathetic ganglia to the various organs and parts of the body."

"The peripheral vaso-motor system, which keeps the capillaries and blood-vessels in a state of tonic contraction, is reinforced by the impulses coming from the brain vaso-motor centre and is in constant action."

"When a sensory nerve is stimulated, this centre is thrown into increased activity, the blood-vessels in general contract, and of course increase the blood pressure in the arterial system, by the greater resistance to the passage of arterial blood into the venous system. There is also a vascular congestion of the region to which the irritated sensory nerve is distributed. This irritation paralyzes the peripheral vascular ganglia in the vicinity irritated."

There is also the sensory nerve of Cyon and Ludwig, which, when excited, inhibits the parts supplied to it and paralyzes the main vaso-motor centre in the brain, and thus causes the whole capillary system to dilate, and hence the blood pressure falls, there being less resistance to the passage of blood into the venous system. Besides the vaso-motor centre in the brain, there are others in the spinal cord which act.

I have quoted from Dr. Ott fully on the vaso-motor system, because, although he has not to my knowledge experimented with chloroform, his valuable experiments, in general, have an important relation and shed much light upon the subject we are considering.

When after death, in a chloroformed subject, the skin is cut, its substance is pale and bloodless. I have never lost a patient from chloroform, but often, under the profound influence of this agent, I have seen the human patient pale and cold. Why is this? Is it not due in part to the nerve of Cyon and Ludwig being paralyzed? The capillaries of the skin cannot be contracted, for the heart and great blood-vessels and the vessels in general are engorged with blood and relaxed. The vaso-constrictors are paralyzed by the chloroform and permit the blood-

vessels mainly in the abdomen to enlarge; when we know the final influence of chloroform is to paralyze, it cannot be that by its agency the vaso-dilators are stimulated to enlarge. The inhibitory fibres in the skin must be paralyzed also; so that there is only one class of these nerves, the vaso-constrictors, which, being paralyzed, permit the dilatation of the heart and blood-vessels, as has been found in nearly every one of our cases reported in our experiments. The great fullness of the internal vessels and organs with blood would account for the paleness of the surface of the body, the blood having been drained away from the surface to the internal organs and vessels. This full state of the heart and blood-vessels is favorable to arrest of the heart's motion, and while it is not probable that this effect is the cause of death, yet it is one of the factors in inducing it. Thus I think that the paralysis of the excito-motor and inhibitory centres of the brain, from chloroform, will be assisted by paralysis of the vaso-motor centres, and the consequent dilatation of the heart and great vessels.

But how are the lungs affected in chloroform anæsthesia pushed to death? The primary influence of this agent is to stimulate the lungs to increased acts of respiration and to increase the secretions of the mouth, throat and salivary glands and those of the bronchial mucous membrane. Its secondary effects are to anæsthetize these surfaces and remotely to paralyze the peripheral nerves of the lungs and lead to passive congestion of the blood-vessels of these organs. The vaso-excitors also being paralyzed, would also favor engorgement of the blood-vessels of these organs by their enlargement. At the same time that the lungs are locally affected by the chloroform and the vaso-motor paralysis, the excito-motor and inhibitory centres of the brain and medulla aid the vaso-motor paralysis in arresting respiration, and this affection of the brain and vaso-motor

nor functional diseases of this organ with fair heart force. Atrophy and fatty degeneration of this organ contra-indicate their use.

Chronic alcoholic drinkers are dangerous parties for anæsthesia. Persons already insensitive from great shocks due to various injuries generally bear chloroform badly. I have seen this tried, and unless there is ample heart force this agent will depress. Persons with thready pulse from injuries bear this agent badly. Parties with chronic organic diseases of lungs, as bronchitis, accompanied with free secretions in lungs, are liable to give trouble during anæsthesia. Organic brain lesions require the most careful consideration ere this agent be used. Observation has taught me, as well as authority, that recumbency, as well as a free supply of air, is essential; that warmth of surface and extremities is important; also that the pulse, respiration and iris (a dilated pupil should dictate caution at least) should be closely watched, and on the slightest failure the agent removed. When the cornea is insensitive, the insensibility-point has been reached and the agent should be removed for a time. A moist and cold skin and extremities denote caution. Brandy hypodermatically and artificial heat and sinapisms will aid artificial respiration, and also electricity.

I believe chloroform affects the secretions less than ether; but the latter is a safer anæsthetic than the former. I have seen cases that I could not etherize, as they would cease to inhale enough to anæsthetize. I would say care should be exercised in giving chloroform to old or feeble persons. Children and parturient patients bear chloroform well.

It occurs to me now that a medium-sized dose of strychnina, given hypodermatically half an hour before the chloroforming, would be a valuable safeguard by increasing the irritability of the nerve centres of the medulla and

spinal cord. Morphia is said to increase the blood in the nerve centres, but it is a narcotic, and it would hardly be proper to add this influence to the chloroform narcosis.

Chloral has been advised, but it certainly favors heart failure and nervous exhaustion. Nitrite of amyl until the face flushes does good. A dependent position of the head is valuable, as it determines blood to the head. Small restorative hypodermatic injections of atrophine are feasible. The fact that the respiratory and heart centres of the medulla are stimulated to action by carbonized blood is favorable, and may to a limited extent overcome the influence of the chloroformed blood circulating in these centres.

ZANESVILLE, OHIO, May 18, 1889.

DISCUSSION.

Dr. X. C. Scott of Cleveland said:

I endorse what was said by the gentleman, and that is the effect of it immediately on the heart's action. I must say I never knew until five years ago how to use chloroform, and at that time I learned that in giving chloroform the patient should not eat anything five or six hours before the operation, and half an hour before the time of the operation to give a large dose of whiskey, and since that I never have any difficulty. There is no question but what death takes place from deficient heart action; I have had patients where I had to work for an hour before I got them through. At present, in every one of my patients I insist upon two things, first, that they take nothing for several hours before the operation. I operate always in the afternoon. I instruct my patient to take a light breakfast and a half hour before the operation I give from one to three ounces of whiskey, and since I have adopted this, I very seldom have vomiting and have had no trouble with the heart's action.

Whiskey does not act well with ether, but it does act well with chloroform. I have used whiskey in connection with ether, and I had unpleasant results from it.

Dr. Reuben A. Vance of Cleveland said:

It has been my fortune to see patients die from anæsthetics and to have their death assigned to other causes, to see patients die during operations from some calamity of surgery and have their demise ascribed to the anæsthetic. The surgeon in whose hands a patient dies from an anæsthetic knows the manner in which death comes, whether heart, lung or brain be the organ that ceases to act from the malign influence of the ordinarily harmless anæsthetic. The ulterior consequences of anæsthesia do not concern us now, consequently it is not necessary to dwell upon the aspect of the agent employed to obviate pain, save its immediate lethal influence in certain exceptional and fortunately rare cases. And here let me say that the only agent I have employed for more than twenty years has been chloroform. It by no means rarely happens that this agent, when given a little too freely, will induce convulsive phenomena. These I dismiss, because, though alarming, I have never known them prove dangerous. The cyanotic hue that develops occasionally from derangement of respiration, while the heart still continues to beat, is a danger signal that anyone can recognize; once recognized, no one but a foolhardy man would ignore it. If the chloroform be stopped, the system invariably rights itself. Great as the danger may be, the manner in which it develops and the opportunity afforded the practitioner for efficient action, renders the number of patients lost from this irregular action of chloroform very small indeed. But with the next class of cases, those in which the toxic action of chloroform is denoted by failure or cessation of heart action, all practical surgeons will bear out the statement that here the great perils of anæsthesia are encountered. Here we have no signals to warn us, no trivial symptoms that at most do no more than alarm us. The heart beats and it stops; it may beat again and it may not. If, while an anæsthetic is being given, the heart beat becomes tumultuous, the surgeon should take warning; if irregular, he must be vigilent. The heart is the organ at which death from anæsthesia may be expected to commence; to its behavior the operator should always be attentive. After some years of experience the surgeon recognizes the importance

of feeling, *himself*, every beat of his patient's heart during the essential stages of an operation, and he will find means of doing it. The pulse is his chart; with his finger on it he may not prevent an explosion, but, like the skilled pilot, he will at least be sure of avoiding the shoals and quicksands, and keeping his charge in the recognized channels of safety.

THE MODERN THEORIES OF TUBERCLE AND THE THERAPEUTICAL TESTS.

BY H. J. HERRICK, M.D., CLEVELAND, OHIO.

The problem as to the etiology of tubercle is now up for solution, and the subject is indeed worthy of the most careful consideration. The fact that a congress for the consideration of tubercle was held in Paris July 25, and for six succeeding days in 1885, bringing together pathologists of note from all parts of Europe, South America and the United States, indicates the importance of the subject; also that the inquiring ones of the profession are seeking to explore this as yet unknown field.

The fact, too, that the tubercular formations are recognized as the direct cause of very many of the most grave forms of disease, and those which are the least amenable to treatment, renders it obligatory upon us as physicians to give earnest heed to the questions involved.

The questions pertaining to tubercle may be considered macroscopically and microscopically. The former, under accepted principles in physiology and pathology, must not submit the whole question to the latter, who sees through his aided vision things greatly magnified, and from them is liable to draw too hasty and too sweeping conclusions.

I announce myself as belonging to the first class of inquirers, yet wishing to be regarded as an humble, unprejudiced seeker, though perhaps naturally of a skeptical turn of mind.

What is tubercle? What characterizes it as such if it

has precise, definite quality? Is it a neoplasm, or only a deposit without distinctive type? What is its source? What its cause? These questions have been, and are still to be, answered by different ones, until more appreciable rational conclusions have been reached. It should be observed that they are to be answered not by seeking data on which to confirm a preformed theory, but under the light and guidance of established histological and physiological science. The theory should also bear the crucial test when brought under application in clinical experience, by giving guiding principles for the relief of those suffering from this malady.

What, then, we again inquire, is tubercle? We answer that we recognize no absolute type to which it seeks to conform, such as all natural creations have. Abnormal productions are non-typical, as all diseased conditions are. Tubercle is heterologous, abnormal, a morbid product, being modified by different conditions it assumes, diversity of form, color, texture and degrees of hardness; it is also observed to appear differently at different ages of growth as it is found in different locations. It has been spoken of as a swelling by the accumulation of foreign matter in the substance of an organ. It always occupies the place of the normal tissue. It contains no vessels, nerves or lymphatics in its structure. It is defined by Wagner to be an "infiltrated or nodular, non-vascular, new formation, almost always multiple, irregularly formed, and, for the most part, small miliary of varying size, consisting especially of nuclei, small and large, indifferent cells, giant cells and granular matter, all being imbedded in a reticular tissue." This definition, in a general way, we may admit. The constituent parts are variable in their relative amounts. The reticular tissue, if present, is imperfectly formed and in varying amounts, indicating the varieties as cellular and fibrous.

It is to be observed that a process of the [illegible] that might be expected to belong to a deposit from the blood: being within the capillaries, at first [illegible] colored, semi-transparent, soft and [illegible], or being compressed by accumulation becomes firm and [illegible], having the appearance of cheese curd. With this appearance it is said to have undergone certain degenerative changes, though from the first its organic structures are so loosely organized and so destitute of any definite type, that the term is hardly applicable in strict sense, the histological elements being from the first degenerate. It is formed not from the normal but from abnormal constituents in the blood. Indeed it may be said to be a deposit of the debris from the blood or an assimilable, nutritive material derived from the imperfect processes of the blood-making organs, of which I shall speak further.

It is admitted that the elementary histological structures observed are non-typical, but are large or small, shrivelled and irregular. The stroma is variable in amount, if, indeed, it can be said to be an essential constituent. Nuclei and granular amorphous matter make up much of the bulk of this substance.

Now, beside these varied and variable semi organized substances, are observed under the high magnifying power of the microscope, and by the aid of analine dyes for bringing to view these new objects of interest, minute living organisms. Different forms have been observed from time to time by different observers. Among these, the one form which receives special consideration at this time is known as the "bacillus tuberculosis," as described by the eminent microscopist, Robert Koch. To it is attributed by him and others the important function of producing, directly or indirectly, all the other substances observed. Further, through its migratory disposition from individual to individual in different media,

it is assigned the power to prey upon all animal life from the lowest to the highest order. It is not new that this morbid mass has been assigned to minute organisms for its cause, or that the morbid material is capable of reabsorption, creating new foci of the disease in parts near and remote from the points of inoculation.

Kortum, as early as 1789, Cruveilhier in 1826, and others by experiment, have shown that by inoculation the tuberculous material, as also other morbid substances from man and other animals, could be communicated so as to develop tubercle in the lung; hence tuberculosis and certain allied diseases were regarded by them as infectious. Interest in this method of propagating disease was excited by the experiments of Villemin, which were communicated to the French Academy in 1865. He inoculated with the tuberculous mass without reference to any specific germ. In 1877 Klebs cultivated an organism which he called the monas tuberculosum, which he regarded as the specific cause of the disease. Schultrin, in 1880, described the micrococci in tubercle, which he regarded as carriers of the morbid material, not that they were the specific cause. Touissant made known to the French Academy in 1881 his discovery of the organism in tubercle, which, according to his opinion, by cultivation and inoculation in lower animals, caused tubercle. Aufrecht described three forms of organisms in tubercle, one of which was probably the same as Koch's bacillus. Numerous experimenters have inoculated tuberculous matter and observed secondary deposits in different tissues, but it remained for Robert Koch to consummate the experiment, by cultures of the germ and inoculation, fix attention upon what he regarded as the special cause of tubercle. Judging from the current literature, it would seem that most of the profession have accepted his conclusions as final, and are carrying out, as they must, the

theory in the practical questions of prophylaxis and therapeutics. Koch's conclusions are based upon experiments made by him alone. Others have, by similar means, been able to concur partially in his conclusions, while others totally condemn them.

In 1882 he made the announcement of his discovery in a report which he made to the Berlin Physiological Society. Various experimenters before him had claimed that tuberculosis was a specific disease. Villeman, Fox, Sanderson, Clark, Cohnheim, Solomonson and Buhl concurred in this opinion. All were seeking for the specific factor, but it remained for Koch to present to view, by the aid of dyes, what, to his mind, was the long-sought specific enemy of animal life which had manifested itself in this form.

He accomplished his object by the use of methyl blue and vesuvin, which caused the peculiar staining of the bacillus tuberculosis, to the exclusion of the other bacteria. He made numerous experiments and announced that he was able to isolate these bacteria from others with which they were found. The bacillus was described as rod-shaped, from one-fourth to one-half the length of a red blood disk.

These bacilli make their way first, he claimed, into the wandering cells by infiltrating, surrounding and irritating them, and by these means cause the death of the leucocyte, the accumulation of which, with the débris, causes tubercle ptomaïne. The idea is that the tuberculous mass is formed somewhat as the nut-galls are formed about the insect that stings the limb of the tree in which it deposits its egg. The nut-gall is the ptomaïne for the Diplolipis Gallæ, which, having deposited its egg after puncturing the tender limb of the tree, the wound from the sting results in the accumulation of the juice around the egg, which serves both as a protection for the egg and a nest for the

hatching of its young. Now, if I am correct in my understanding of the theory announced by Koch, as to the method of action of the bacillus, it is that they attack the leucocytes, the effect of which is to abort their future development, and they, by their degeneration or death, become the nidus for the swarm of bacilli that join the war of conquest—the degenerate, the dead or changed leucocytes become the tuberculous mass; the term ptomaïne being from the Greek "πτωμα, that which has fallen; πεπτω, to fall; hence, the body of one fallen in battle; any dead body, a carcass. (Thomas.)"

His experiments and observations, which became the foundation of his conclusions, were as follows:

In eleven cases of miliary tuberculosis the bacillus was always found; in twelve cases of pneumonia, in one of tubercle of the brain, in two of the intestines, in three of scrofulous glands, in four of fungous joints, the organisms were uniformly present. Among lower animals, the bacillus was found in ten cases of "pearl disease" in caseous cervical glands of the pig, in the organs of a hen dead from general tuberculosis, in three monkeys, nine guinea-pigs and seven rabbits.

The bacillus from a pure culture was inoculated in one hundred and seventy-two guinea-pigs, thirty-two rabbits and five cats. In all cases the animals died of tuberculosis and the bacilli were found in their tissues. He next proceeded to ascertain whether the organism was an accident or a cause, and cultivated the bacillus apart from the normal habitat. He used the serum of ox blood, it being heated so as to destroy all germs, then heated to 75° C., until reduced to a brown transparent jelly. The bacilli were cultivated from this in cells. Their development was slow, requiring many days, during which time they appeared motionless. This he regarded as their period of incubation. He further observed that they

grew only at a temperature between 30° and 41° C. The cultivations were continued several days and often repeated.

Different generations of cultures were carefully injected into the peritoneal cavity, anterior chamber of the eye or veins of a healthy animal—guinea-pigs, rabbits and cats. In most cases, true tuberculosis followed. Numerous experiments were made; the culture fluid being injected with the bacilli present, resulted generally in tubercular disease. The same being injected without the bacillus, no results followed.

It is to be observed here that the injection of any crude material, as a solution of starch, milk or any unorganized material not having been digested or assimilated, have been found to be subsequently deposited in the form of tubercle, in which also bacilli were found.

Koch maintains further that in the sputa of phthisical subjects the bacilli are always present, but not in that from ordinary bronchitis. From the slow development of the organism, he argues the slow development of the disease. Based upon the conclusions of his experiments that tuberculous diseases are produced by the specific germ, is the theory of the contagious character of phthisis pulmonalis, and the sputa the dangerous source of infection. I believe I am sustained in the assertion that the theory does not carry the clinical experience or approval of the common sense of the profession.

It is obvious that Dr. Koch has made most minute and painstaking experiments to prove a preformed theory which had been a subject of theoretical belief by many other observers before his day. It is obvious, further, that from the difficulty of mixing and arranging the special dyes and of the repetition of the experiments, so as to establish the truth of his views, they stand as a theory based largely upon his experiments, and a theory only to the exclusion

of other and more rational views. A large number of the profession are willing to accept his conclusions and act upon them in clinical practice. Others find bacteria in tubercle as in other diseases, but not those described by Koch, or do not attach a causal relation to their presence. Some with ridicule facetiously speak of the organisms as "Koch's bugs," and regard them as of slight significance as to the cause of the disease, but only an accompaniment. The practical conclusions, from a prophylactic and therapeutic point of view, growing out of the acceptance of this theory, are so at variance with the previous teachings and experience that we should demand more confirmatory tests before accepting those views as our guiding principles. We would not depreciate or undervalue these minute examinations and experiments. The presence of bacilli may be, and no doubt are, of value in a diagnostic point of view, but, as a matter of fact, all careful clinicians must admit the futility of any treatment based upon this theory. In a clinical point of view a pretubercular condition is always found, in which, for a longer or shorter period of time, there is serious impairment of the digestive process. It is also obvious to the careful clinician that a careful examination, by the various means at command, of the digestive organs, reveals the organic disturbance. Further, it is a fact, so far as I am able to learn, that no material alterations have been made to the experiments instituted by Koch. Many have followed, with a borrowed light, in his footsteps, but in all it must be admitted that many links are wanting to establish the fact that all of the large variety of tuberculous diseases are the result of infection. No clinical experience can be adduced to sustain this theory without meeting a thousand-fold more to disprove it. The theory, as I understand it, is as I have stated, and the experiments and facts substantially, upon which the theory rests, are as I give them.

Does this theory explain the facts and phenomena observed? Must the physician in his practice adopt this as final, and proceed to act upon it in his treatment of cases, and also adopt the prophylactic and hygienic means proposed? This is, of course, the practical sequence. In view of the practical importance of this matter, let us enquire as to the security of the path we are asked to follow. It is to be observed that we are conducted outside of the body for the cause, and that cause is not found to be one that affects either of the great functions of respiration, secretion, digestion or nutrition directly. We are shown a specific cause, and must have a specific disease and seek a specific remedy. We are led to abandon all enquiries as to organic disturbances in the order of physiological function. We are required, in our treatment of tuberculosis following this theory, to enter the contest with blind empirics, with our herculean club strike at the myriad host of unseen bacteria, little heeding that our patient has fallen a victim while our scientific (?) weapons have been diligently used.

Germicides are administered locally and constitutionally, it matters not if they are the most deadly poisons. "Pneumatic cabinets," "hot air inhalations," "fumigations," "vaporizations," etc., etc., must be used *ad infinitum* with a view to destroy germs, all the time neglecting rational means which lie in the line of our scientific training. We must at the same time seek to construct an effective quarantine against consumptives, as fatal and inhuman as that of the Jew against the leper of ancient days.

In a valuable paper presented to this Society by my esteemed friend Dr. J. T. Whittaker last year, he reported that after an extended application of germicidal agents and antidotal means for the treatment of consumptives, no case subjected to such treatment gave th-

evidence of lasting improvement. In that paper the distinguished author declares that the chain of evidence relating to the cause of tuberculosis, as announced by Koch, was so strong and perfect, that not a flaw could be detected in a single link. In the same paper he also declares that the etiology of tuberculosis, so far as the seeds of the disease are concerned, has become a fact as fixed as that of the circulation of the blood. The circulation of the blood is demonstrable by any tyro. Yet the demonstration of the etiology of tubercle by the bacillus rests upon such experiments as I have mentioned, the conclusions of which are held in question by many of the best pathologists of the world. The bacillus having been announced as the cause, bright hopes sprang up in the mind of the clinician that practical advance would be made in the treatment. But those hopes have not been, and do not promise to be, realized in that line of search.

Now to my mind, as a seeker after disturbed normal functions in a complex organism, we are seeking to no purpose. We seem to have abandoned any systematic line of search and are vaguely groping our way under the guidance of one who, with a little more extended light in a single direction, is likely to lead us into more obscure darkness.

The objection I make to the conclusions of Koch and his followers is, that the experiments and argument do not carry the conclusions; they are neither supported by fact, analogy nor common clinical experience.

The experiments have all been made upon the lower order of animal life and those that are most susceptible to destructive agencies. Other experimenters have injected different forms of crude material into the same classes of animals with the same results. Furthermore, it is, perhaps, proper at this time for me to express my non-

acceptance of the prevailing fashion to refer most diseases to microbes of some sort.

No idiopathic disease can be mentioned that has not been referred to some microbe as its cause, as if the normal function could not be disturbed except by some form of bacteria, and that the form of disease is to be determined by the variety of bacteria. I am willing to grant that in all diseased products bacteria may be and are found, but to assign to them the power of causation I am not willing. The bacteria found in the exudate and membrane of diphtheria has been and is regarded the cause. The typhoid bacillus of Klebs, having been found in fœcal evacuations or in the diseased glands of the ilium, has been regarded as the cause of typhoid fever. Eager chase has been made after the supposed specific germ causing intermittent and bilious fevers, the palmella of Sailesbury, the bacillus malariæ of Tommasi, Crudeli and Klebs. Others have announced the discovery of the specific germ in malarial poison, yet we still, for lack of a better, use the term proposed by Lancisci nearly two centuries ago, which simply means bad air, although often vaguely used as if it defined some specific disease without reference to the organic disturbance. Since infusorial life was revealed by Leuenhock two centuries ago it has been scrutinized minutely with a view to finding in it a cause of disease. The bacillus of anthrax, proclaimed by Davine first and confirmed by others, was but the antecedent of the theory which to day refers almost all diseases to some variety of bacteria. Yet I venture the assertion that the theory does not find approval in clinical experience or by the judgment of the common sense of the profession. As I see the conclusion of this theory, it carries with it the idea that disease is of a specific nature and is to be treated by some specific antidote. Yet this conclusion cannot be sustained in a single instance.

Now in the foregoing discussion, regarding tubercle, it may be charged that I would seek to overthrow the theory of its cause without showing a better explanation of the morbid process. I would briefly indicate what seems to me a rational view of tuberculous formation, from which we may clearly observe a rational line of treatment and the one in the direction of which has been the greatest clinical success.

As has already been shown, various opinions have prevailed as to the nature of tubercle. Wagner and others regard it as a neoplasm derived from the connective tissue series, especially of the lymphatics and sheath of small arteries and capillaries. Still others claim that it is only a retrograde metamorphosis of the pre-existing structure tissue elements. Rokitansky, Lebert, Ansel and Hughes Bennett regard it as an exudation of the liquor sanguinis, differing from the inflammatory exudation on the one hand and cancerous on the other. My judgment is that it cannot be regarded as an inflammatory exudation, though it may occur in connection with inflammatory products. It, as it accumulates, is a cause of inflammation, acting as a foreign substance. I do not regard it as a neoplasm, not having the histological organic structure of a new formation, being without vessels, nerves or absorbents. I have a theory for accounting for the tubercular formation, which, to my mind, grows out of a rational consideration of the physiological processes. Yet, in presenting my views, I must speak of them as a theory only. Acting upon them, however, in my clinical experience, I have secured the most satisfactory results.

My reasoning is in this wise: All tissues are derived from material furnished from the blood. The blood itself is a complex fluid derived from the food taken, and for its constitution must be preceded by the complex processes of digestion and assimilation. Our hope in medi-

cine rests upon the fact that these processes are coming to be better understood with the light of minute physiological research. No process of the body is more complex than the blood-making process, and it is elementary to all other vital processes.

It calls for food adapted to the varied wants of the body, the nature and amount of which must be adapted to the age, growth, development and occupation of the individual. The successive changes may be noted in a general way, that we may appreciate the liability of defects:

1. Food undergoes mastication and salivation, by which a portion of the starchy or farinaceous constituents is rendered fit for absorption.

2. The action of gastric juice is observed in dissolving the nitrogenous constituents.

3. It is mixed with the secretions of the glands of the duodenum and the pancreatic juice, which emulsifies the fatty constituents; also acts upon the farinaceous substances that have escaped the action of the saliva. At the same time, the bile is poured into the channel from the liver, which renders all adapted for absorption. Finally, the residual mass is passed along through the long intestinal canal under the impulse of peristaltic action, still rendered fluid and favorable for absorption by the action of secretions along the entire tract. Yet, supposing these complex processes to have been complete, after absorption, the further process of assimilation may be at fault. More of the sugar and farinaceous material may have been taken and more have been absorbed and passed into the portal vessels than can be transformed by the liver into dextrine glucose, and further, by unexplained changes, into fat or other chemico-vital changes, for the further elaboration into blood.

What, then, are the results of this defect upon the organs involved and also the health of the individual? A careful clinical experience will find in this supposed excess of one class of food, a way to rationally explain a large class of pathological conditions. It is not my purpose at this time to enter more fully into the consideration of certain changes that may be conceived of as having their explanation in some such defective process. Suppose such material to have passed to the liver through the portal system, and through the anastomosing veinlets of the hepatic vein to have been carried to the heart, thence to the lungs—is it difficult to conceive of the results? The respiration is the next process for the elaboration of the blood, but it is impaired by the inability of the lungs to eliminate the unassimilated substance. What is more reasonable than to suppose that the unassimilated material will be deposited in the lung, first in a thin, translucent, pearl-colored deposit, which, by accumulation, becomes more and more compact and opaque, filling the minute blood-vessels of the lung, hence impairing its function and furnishing all the phenomena found in tuberculosis in its various forms and stages. Again, we may by this hypothesis explain the various abnormal histological elements present. We may further explain the presence of the various microbes in tubercle that have been pointed out from time to time by various microscopists, by supposing that the germs exist in the food, blood and tissues only, ready for rapid development and propagation when the favorable conditions exist. Nothing lies dead in nature. She is generous in supplying germs for the retrograde changes of matter from a higher to a lower order.

Now, by a glance at these complex processes of blood-making from the food taken, considering the variety of disturbing influences and conditions that may occur, it

seems to me that we have little difficulty in conceiving of such impairment as shall materially change the condition and quality of the blood. After digestion, *respiration*, fraught with most grave consequences, must be complete. In most climates on the face of the globe the air is adapted to perform its part in this process, but when the preliminary changes have not been secured, respiration cannot be complete in any climate.

The science of physiology has so far advanced as to quite minutely define each step in these blood-making and blood-purifying processes; by inference we may appreciate the results of defects in either of the different steps.

Now, the first condition of normal nutrition in all tissues is a right state of the blood, which not being secured, disturbed nutrition is the result, which is disease. In such complex processes as we have alluded to, for the transformation of food into blood, it is not difficult to conceive of certain unassimilable material as having entered into the blood current, not only unfit to contribute to nutrition, but prone to retard it; not being in a condition for nutrition or elimination through either of the channels of elimination, the only remaining means of disposition is by deposit. Thus, it seems to me, we have a common-sense view of accounting for the deposit of atheromatous or calcareous material upon the coats of arteries. Thus, also, we may appreciate the phenomena of the deposit of tubercle in the tissue of the lung, the cancellous structure of bone, or, indeed, in any tissue where found. The presence of microbes does not imply causation. The myriad germs that float in the atmosphere find their way into the body through the lungs or food taken. They are ready to develop and multiply when favorable conditions exist. The favorable condition is the presence of any plasmic matter not already being used by the biotic

forces of the body. The deposit is such matter; in it the germs find their appropriate nidus. We recognize the fact, however, that the bacillus of tubercle may be an important aid in diagnosis.

Now, by the brief and imperfect presentation of a theory to account for the origin of tubercle, I am sure that I am seeking the cause of the disease along the line of defective physiological functions.

I am also sure that a careful clinical experience and observation will bring indubitable testimony to the support of this theory. There is always to be observed a pretubercular condition, manifested by impaired digestion, with often marked organic disturbance, tenderness, anorexia, flatulence, constipation, etc. These antecedent disturbances may prevail for a longer or shorter period in different individuals. Besides, inherited constitutional type and temperament may lend their influence to quicken or retard the impairment of the processes.

Is there not also a convincing argument in support of this line of inquiry, in the fact that all treatment that has in the past given the least promise for relief has come in the direction of proper alimentation? Medicines for the CURE of tuberculosis may be sought in vain, but agents that shall look to correct disturbed digestion and assimilation offer a most promising hope. I have no hesitancy in claiming that if the careful examination shall early detect the source and character of the morbid processes and rational means be applied to correct them, this grave form of disease is amenable to treatment.

In this line of treatment, after a more minute acquaintance with the morbid processes, the profession will yet be able to meet the demands of humanity for the cure of consumption.

It is not to be supposed that the disease is amenable to treatment in all stages. In all diseased processes, the

destructive changes may go on until it is not within the capacity of nature to repair the breach. The destructive may exceed the constructive forces, which, if protracted, become incurable, and can end only in death. In following this line of reasoning as to cause and treatment of tuberculosis, I have attempted briefly to present my convictions after extended experience for the past twenty-five years, accompanied with no little reading and earnest thought. It is my firm conviction that if the disease be early detected, when the tubercular deposit is in the gray stage, and the disturbed secretions, digestion and assimilation be *corrected*, we may not only hope to arrest further deposit of tubercle, but also secure the resolution of that already deposited. I am able to recall a large number of cases which time would not permit me to report at this time, in which such results have been secured.

In concluding this already too long paper, I would urge the seeking after diseased processes along the paths of established physiological principles. Further conclusions, obvious if the previous reasoning is correct, are: First, that tubercular disease of all localities is primarily a disease of the digestive organs. Second, that tubercular disease of the lungs is not to be treated successfully by local applications or a resort to change of climate, but by early and appropriate attention to the condition of digestive organs and food taken.

CHRONIC THROAT AFFECTIONS OF RHEUMATIC ORIGIN.

BY MAX THORNER, M.D., CINCINNATI, OHIO.

ACUTE tonsillitis and pharyngitis have been known, to early writers, to be sometimes local complications of acute rheumatism. These manifestations in the throat are either of a prodromic nature, followed sooner or later by an attack of articular or muscular rheumatism, or they are established after other parts of the body have been affected; or the rheumatic throat trouble may be idiopathic. Thus we hear and read of *angina rheumatica*, *tonsillitis rheumatica*, etc., and have become used to treat these affections as manifestations of rheumatism with results that are mostly very satisfactory.

CHRONIC rheumatic affections of the throat are little known, or at least described. Yet there is no doubt that we have, not unfrequently, to deal with obstinate throat ailments that are associated with or due to chronic rheumatism. The first who called attention to this form of chronic laryngitis was Dr. E. Fletcher Ingals of Chicago, in a paper read before the Laryngological Section of the Ninth International Medical Congress at Washington, in the year 1887.* Since that time I have paid more particularly attention to this variety of laryngitis, and am able to corroborate the statements of Dr. Ingals in all essential points. In fact, I could distinguish a form of

* Transactions of the Ninth Inter. Med. Congress, Washington, 1887. Vol. IV.

chronic pharyngitis and laryngitis that was evidently due to rheumatism. These affections are, as a rule, very obstinate, and resist every treatment except that which is directed against the diathesis.

The most prominent symptom of this affection is pain, either in the pharynx, or in the larynx, or in both. We may therefore follow Ingals in calling it chronic rheumatic sore throat. If we take in consideration the nature of rheumatic inflammation in general, we can readily see why certain regions of the throat have apparently a predilection for localization of pain and other symptoms. Rheumatism is preëminently a disease of the motor apparatus. We may, therefore, expect to find the seat of the rheumatic affections of the throat in the numerous small muscles of the same, and the fibrous tissues connecting the muscles with the bones and cartilages, and with each other. And, indeed, the anatomical conditions for such affections are plentiful in this region. The muscular cover of the frame-work of the neck consists of a number of small muscles, with comparatively extensive fibrous and aponeurotic connections, and these latter structures seem to be greatly predisposed for the localization of the rheumatic attack.

Regarding the etiology and pathology, not much has been ascertained as yet. We know that the chronic muscular rheumatism has a somewhat doubtful position in our classification of diseases. And yet it is a well-known fact that we meet frequently with painful muscular affections, which we are accustomed to term chronic muscular rheumatism, even if it were only for want of a better name. Pain in certain groups of muscles as well after use as on pressure, exacerbations of the soreness during changeable weather, remissions during fine weather, no visible or palpable changes of structure, the absence of fever, the fact that anti-rheumatic treatment is the only

one that affords relief, and the absence of any other plausible cause of the pain, and impaired action, are the principal reasons for such a diagnosis. Thus we leave any speculations regarding the nature of the specific poison out of consideration. Taking this view, we may well accept the term chronic rheumatism, of which Dr. T. J. Maclagan, in his treatise on rheumatism, says: "It is due to the presence and direct action of the rheumatic poison, and is not necessarily, or even usually, accompanied by any perceptible change in the textures involved. It consists simply in rheumatic disturbance of the affected tissue. It differs from the acute and the subacute form, not in nature, but in degree, and sometimes in the special textures involved. It is a true rheumatic attack, in which the morbid process and local disturbance are not sufficiently marked to raise the temperature, or to lay the patient up. The textures involved are the same as those which suffer in the acute and subacute forms, with this difference, that the fibrous aponeuroses and muscles are more apt to be affected. Indeed, for clinical purposes, cases of chronic rheumatism might usefully be divided into two classes—chronic articular rheumatism and chronic aponeurotic or muscular rheumatism."

The principal symptom of chronic rheumatic sore throat is, as the name implies, pain, localized in and about the pharyngeal and laryngeal region, sometimes extending from the faucial region towards the jugulum. However, in most of the cases that have come under my observation, the pain did not extend over so large a surface, but was more frequently limited to small circumscribed areas. There are a few spots which seem to be predisposed to the rheumatic attacks, and these were the posterior pillars of the fauces, the root of the tongue (an analogon to the acute form of lingual rheumatism, mentioned by Mr.

Henry T. Butlin),* the whole region over the hyoid bone, especially corresponding to the location of the greater cornua, and the lateral parts of the thyroid cartilage. The anatomical conditions of the region around the hyoid bone, where the fibrous attachments of so many small muscles are centered, and of the outer surface of the thyroid cartilage, with the insertion of several muscles, explain readily the cause of this predilection. These rheumatic pains are intermittent, and worse during changeable weather. On pressure we find often exceedingly painful spots, particularly in the region between the hyoid bone and the trachea. Deglutition is mostly, phonation sometimes, difficult and painful. The whole neck, including the large muscles, may be affected, so that we have a veritable *myalgia cervicalis chronica;* and even an impairment of action may result, that the head is turned more or less towards one side, in which case we have a form of *torticollis rheumaticus chronicus.* In addition to the pain, the patients complain often of a dry or burning sensation in the throat, and in a few of my cases the sensation of a foreign substance was very troublesome to the patient. Though some of the patients experience fatigue when speaking, I always failed to notice more than slight huskiness of the voice.

Locally, there is more or less congestion of the mucous membrane, which is sometimes limited to small circumscribed spots. These latter are always very sensitive. As a rule, the congestion and swelling are not very pronounced, and may be even missing at all. Erosions, ulcerations or neoplastic formations are never found in the throat. The vocal cords may or may not present a condition as it is found in chronic laryngitis, and the approximation of the same was noticed to be somewhat

* Diseases of the Tongue. 1885.

impaired in a few cases, where one of the principal complaints of the patients was the fatigue experienced after any attempt at speaking. I never saw a case among these chronic affections like that of Laranza, where, during an attack of acute laryngeal rheumatism, the intrinsic muscles only of the larnyx were affected, the vocal cords being fixed in the middle line, which resulted in complete aphonia. In this case all pain was absent.*

The diagnosis must, in addition to the local symptoms, be chiefly based on the history of the patients. Most of them have suffered from other manifestations of rheumatism before, or may have inherited a rheumatic diathesis. Sometimes the occupation exposes the patient to so-called rheumatic influences, as in Case I, reported below. However, I have seen cases where rheumatism could not be traced from the history or the occupation of the patients. The pain is different in character from neuralgic pain and yields only to certain treatment, which allows us, eventually, to make the diagnosis *ex juvantibus and non juvantibus.*

In fact, the effect of treatment is sometimes the best aid in ascertaining the diagnosis. Local applications alone have failed in every instance, in my hands, to effect a cure or to afford more than temporary relief. In cases where the congestion was very pronounced, 5 to 10 per cent. solutions of nitrate of silver, or 1 to 5 per cent. solutions of chloride of zinc, used as a pigment, proved useful. Sprays were sometimes very effective in relieving the painful sensations temporarily. I have used with good results the solution of morphia, gr. iv; tannic acid and tannic acid, gr. xxx; glycerine and water, ℥ i v., as recommended by Fletcher Ingals.† Also counter-irritants applied to the skin above the painful spots in the

*Quoted from Dr. J. Solis-Cohen's contribution to the Syst. Med. of the Med. Sci., Jan. 1885.

†Trans. 36th meeting Illinois State Med. Society, Apr. 7, 1886.

form of tincture of iodine or sinapisms, were used to advantage.

The best results I had, however, from the administration of internal remedies. I have used in nearly all cases salol, or salicylate of sodium, in large doses, and found their action in more than half of my cases satisfactory, though not as prompt as in the acute form of rheumatism. When they failed, I seldom could derive benefit from any other remedy, though iodide of potassium, bromide of potassium, extract of phytolacca, oil of wintergreen, etc., as recommended by Fletcher Ingals, may be tried. In very obstinate cases I saw the best results following the application of the electric current, or the use of massage of the neck, or of both together. Massage seems to be very effective in stimulating the circulation in the superficial as well as deeper lymph vessels of the neck, as shown by Dr. Averbeck.* Electricity I have used in the form of the galvanic or faradic current, and had good results in cases that were not amenable to any other treatment.

I have seen, altogether, nineteen cases which I would consider as suffering from chronic rheumatic sore throat. Thirteen of these were men, six women. Their ages were between twenty and forty-seven years. Three of the cases were very typical, and I shall abstract them in brief from my note-book.

Case I. F. K., 37 years of age, an ice-carrier on an ice wagon; consulted me July 17, 1888. He had had a sensation of constriction in his throat since at least one year, and of late a decided pain, which was localized on both sides from the posterior pillars of the fauces towards the hyoid bone. He had never had rheumatism, but his father had been a sufferer from this disease for years. His occupation compelled him often to go, when overheated, inside the enormous ice-boxes in hotels.

* Die Kehlkopf-Massage. Dtsch. Medizinalztg., 1888, p. 397.

There was a well-defined redness in both sides of the pharynx, extending downward toward the bottom of the pyriform sinus. The whole region over the hyoid bone was extremely sensitive, especially so the cornua. Local treatment was unavailing. Salol, in fifteen grain doses every three hours, relieved him as long as he continued taking it, but did not prevent frequent recurrences. Then I used the faradic current daily on both sides of the larynx, continued salol and local applications of chloride of zinc in 3 per cent. solution. Patient was discharged after two weeks' treatment and has been well since.

Case II. Miss M. R., 21 years of age, consulted me February 12, 1888. Had had sore throat since ten weeks. Gargles and home remedies had failed to relieve her. When nineteen years old she had been suffering from articular rheumatism, which had been preceded by a very sore throat. The whole pharynx was moderately congested; the tonsils were slightly enlarged. The base of the tongue was specially painful. Local applications of chloride of zinc, and the use of detergent and sedative sprays relieved her greatly, but not entirely. A few weeks thereafter she was worse again. I then had her take salol in addition to the local treatment, which effected a cure in four days. She was free until last fall, when, after exposure to rough weather, she contracted the affection again. The same treatment had the same result. This time I continued the salol for two more weeks, and had her take an iron tonic, she being quite chlorotic at the same time. She has had no recurrence since.

Case III. A married lady, 40 years of age, of pronounced rheumatic diathesis, was seen by me first November 3, 1888. Had been suffering with rheumatism for many years, and was not entirely free from it at the time she consulted me. She had noticed, during the changeable weather of the previous spring, that her throat

was constantly sore, and, whilst she had been free from any inconvenience during the summer, she was again greatly annoyed since changeable weather had set in. Pain was complained of on both sides of the throat. The whole neck felt sore, deglutition was slightly painful and prolonged speaking tired her soon. There was locally only slight congestion, especially over the arytenoid cartilages. Action of the vocal cords was unimpaired. I employed several local applications, and gave internally salol, afterward salicylate of sodium, with but little relief. These two drugs had also failed in regard to her other rheumatic trouble. Iodide of potassium seemed to help her for a short while only; and massage as well as electricity gave her only temporary relief. Her case seemed to be not amenable to treatment. Finally, after she had spent a number of weeks at the hot springs of Mt. Clemens, Michigan, she returned apparently cured.

These three cases show the average type of this class of affections. They are mostly all obstinate, and recurrences are common. Yet, with the treatment indicated, we may hope to get satisfactory results in a class of affections which otherwise might resist all our efforts, or probably might try our patience, as well as that of our patients, well-nigh to exhaustion. And this is the reason that I believe we may number them among the manifestations of chronic muscular rheumatism.

PHLEBITIS.

BY A. R. SMART, M.D., TOLEDO, OHIO.

By the term phlebitis we understand inflammation in the wall of a vein. The structure of a vein like that of arteries is made up of three layers composing the vessel wall: First. An outer layer of areolar tissue, with a little muscular fibre, a little thicker but otherwise resembling the tunica adventitia of arteries. Second. A middle coat of fibrous tissue yellow and white, with muscular fibre similar to the middle coat of an artery, but with a larger proportion of the former and less of the latter. Third. The tunica intima, a layer of endothelial tissue, consisting of a single layer of pavement epithelium on a structureless basement membrane. In the smallest veins only the exterior and interior coats are found. The tunica intima is not a vascular structure, and depends for its nutrition upon the outer coats. John Hunter, in 1784, defined phlebitis as applying to all the layers composing the wall of a vein. This we know is incorrect. The intima is not the seat of a true inflammatory process; does not exude lymph and form pus as do serous membranes. The walls of veins have little tendency to inflammation, but when found it occurs in the outer and middle coat. Under these circumstances the intima will become clouded, rough and eroded. Denuding a limited section of a vein, by detaching the tunica adventitia, will produce this effect upon a corresponding section of the intima; this results from the interference with nutrition by cutting off its vascular supply. Smith says that

the intima is liable to but one acute process, viz.: an erosion or crumbling away of its structure from disease in the outer coats of the vessel. The intima has a perfectly smooth, glistening surface, and exerts an influence, not perfectly understood, on the integrity of the blood. The intima, too, is somewhat dependent on the condition of the blood and its movement. To maintain a normal condition of the vessel wall and of the blood, a current of healthy blood must be constantly passing along the surface of the intima, the vital activities of either being impaired by disorder in either. Quain says so long as blood remains fluid it does not cause change in the vessel wall. To this statement we take exception. The condition of the blood in alcoholism, nephritis, syphilis, lead poisoning, etc., is known to cause disease in the intima of arteries, independent of clot formation. In syphilis and interstitial nephritis, endarteritis obliterans is not infrequent as a result of blood state, especially in the cerebral vessels. Why may it not similarly affect veins? There are conditions of the blood, the nature of which we do not understand, that cause pathological change in the intima of vessels.

Phlebitis may be divided into two classes, depending upon the nature and source of the exciting cause. If from without the vessel, we find external or peri-phlebitis; if from causes operating from within the vessel, internal phlebitis or endo-phlebitis. Smith, in 'Pepper's System of Medicine,' makes three forms of idiopathic phlebitis: First. Simple or primary inflammation of the vessel wall. Second. The phlebitis arising as a part of inflammation of surrounding structures and involving the vein by contiguity of surface. Third. That arising from blood states. Practically these conditions may be reduced to two, viz.: Those inflammations of the vessel wall arising from contiguity to diseased structures, and those arising from clot

or other foreign matter in the blood-current and from morbid states of the blood. It is not denied that the tissues composing the outer and middle walls of a vein may be the seat of primary inflammation, but aside from traumatic causes it is very rare. First. Of what we may term peri-phlebitis, this type of inflammation in the wall of a vein may arise from cellulitis, erysipelas, injuries of the wall of vein, amputations or operations in general, involving veins or fracture of bones. In some instances it originates in the viscera, as in the liver and portal vein, and in the uterus after labor. It is especially liable to occur in the sinuses of the brain, in connection with scalp or skull injuries; with chronic internal otitis, and with erysipelas about the face and head, particularly facial anthrax. This form of phlebitis may be associated with thrombosis or not, according to its extent and character. In the majority of cases a thrombus forms, but in some instances the inflammatory process in the outer and middle walls of the vein does not involve the intima. If only a portion of the circumference is the seat of disease, there may be swelling and partial occlusion of the lumen of the vein, yet if the intima retain its integrity no thrombus will form. The inflammatory process may be fibrinous (adhesive) or suppurative. In the first instance there will be increase in the connective tissue and thickening of the wall of the vein from interstitial inflammation, but no clot will be formed. Loomis says this is the only form of phlebitis in which no thrombus occurs. The course of adhesive phlebitis is slower and the symptoms less active than in the suppurative type. Pus may form between the outer coats of the vessel which will, from the crumbling away of the intima, enter the blood-current, unless prevented by the formation of a thrombus. Sometimes the thrombus disintegrates and the débris, with pus mixed with it, floats off in the circulation to set up foci

of inflammation in distant parts. This constitutes the most dangerous form of phlebitis, viz.: the suppurative. Again, the adhesive and the suppurative types may occur together; the adhesive, non-suppurative inflammation not unfrequently by blending with the clot formed in the lumen of the vein obliterates it, reducing the vein to a mere fibrous cord. This process occurring on either side of a suppurative inflammation would exert a salutary influence and prevent general dissemination of diseased products. Suppurative phlebitis is by far the most dangerous form because of the greater severity of the symptoms, and because of the tendency of the thrombus which always forms, to disintegrate and wash out into the general circulation. This is the type usually, or at least frequently, occurring in cellulitis, erysipelas and anthrax. It is found not infrequently in the uterine and ovarian veins in connection with diseases of the puerperal state. When it occurs in the course of these disorders it may not display any distinctive features, but develop in a most insidious and dangerous fashion. The second general classification, in which the inflammation or tissue change in the vessel wall is secondary to conditions of the blood itself, are much the more common.

By far the most frequent cause of phlebitis is thrombosis. Thrombosis has no essential connection with inflammation in the vessel wall, and in the majority of instances of clot formation there is no inflammation. Phlebitis is, however, often secondary to thrombosis. Thrombi may occur in arteries, where they are commonly the result of disease of the intima. Thrombosis is much more frequent in veins, and most often is not dependent upon the state of the vessel wall. This is so common that Virchow proposed to abandon the term phlebitis and substitute "thrombosis." Again, he says the disorder known as suppurative phlebitis is not an inflammatory

disease but is wholly the history of a thrombus. In the type of phlebitis in question the changes in the vessel are secondary to the occurrence of thrombosis. As already stated, a thrombus is the result, nearly without exception, of antecedent disease in the vessel wall, so that either as a cause or as a result we find a thrombus an important factor in all types of phlebitis. The term thrombosis comes from a Greek word meaning clot. It is applied to formation of a clot in the living blood or lymph vessels at some given localized point. It may occur in arteries, veins, or in the lymphatics. (Haughey.) In arteries the conditions of clot formation do not so much concern us in the present review, except to say that the condition of the vessel wall is a much more frequent factor of thrombosis than in veins; the blood, under certain conditions, has a tendency toward spontaneous coagulation in the veins. What are these conditions? First, let us consider the nature of fibrin in clot formation. Fibrine, which composes the bulk of the thrombus, does not exist preformed in the blood. It is formed from its antecedents under certain conditions. These genetic principles are fibrinogen, existing in the blood-plasma; paraglobulin or fibrinoplastin, supposed to come from the corpuscular elements. A third factor of the nature of a ferment whose habitat is not definitely settled is supposed to exist. The most recent claims that the haematoblasts or blood-plaques play an important part in formation of clot. Experiments seem to show that the white blood corpuscles and the blood-plaques are each important elements in the process. Wooldridge has shown that the amount of fibrine formed exactly equaled the amount of erythrocytes as determined by weight. It is thought by some that the ferment resides in the vessel wall and is set free at the moment the intima loses its normal vitality. Brothers that the ferment

resides in the blood-plaques and is freed by their destruction and disintegration. These elements, variously known as third corpuscles, hæmatoblasts, blood-plaques and other names, are shown by Osler to be very important in the formation of fibrine. Nature closes a wounded vessel by the formation of a thrombus. The blood-plaques are the elements which are first to settle upon the edge of the wounded vessel. The origin or destiny of these bodies is, as yet, involved in mystery, but it is safe to say they play an important part in coagulation. They are found relatively increased in all chronic, cachectic or exhausting diseases and in fevers in the later stages. It is in just these conditions that an increased tendency to spontaneous coagulation and thrombosis is found. These bodies, if the blood current is moving at a normal pace, keep in the centre with the red corpuscles. If the movement becomes slow and stagnant they collect with the leucocytes along the wall of the vein, where they tend to adhere. The plasma is a living fluid, and while in motion resists coagulation—in this being aided by some influence exerted by the intima. Both the blood and intima depend upon the free and constant change in the blood current for their integrity. Blood corpuscles broken down and disintegrated, or leucocytes from lymph-glands, as practiced by Wooldridge, will not, when injected into the blood-vessels of a healthy animal, induce coagulation. It is only plasma which is tending toward necrotic change that is prone to coagulation. Space forbids more minute inquiry into this part of the subject; but from what is known we may safely assert that the formation of fibrine is a result of necrobiotic change in the blood; that the factors exist in the plasma and in the colorless, and so-called, third corpuscles or blood-plaques; that they are freed and fibrine formed under

conditions that change the normal activity and constitution of the blood or its relations to the vessel wall.

Under what conditions is spontaneous coagulation prone to occur? When we consider that the most frequent cause of phlebitis is a primary thrombosis, that in a majority of cases there is no inflammation of the vessel wall prior to the thrombus, it becomes an important question to note the diseased states in which thrombosis may be likely to occur. Delafield says, "The peculiar state of the blood causes vaginal and vulvar" thrombi; also, "Thrombosis of large veins without inflammation, or other fact in general condition to account for it, is not an uncommon occurrence. It is most often found in elderly people and in the femoral or the veins of the neck." Charcot says the blood in old age has a smaller proportion of red corpuscles and coagulates more readily. Obviously, any cause which increases the proportion of fibrine factors in the blood, will increase the tendency to coagulation. In rheumatic fever, scarlet fever, diphtheria, inflammatory croup, pneumonia, pregnancy, malarial, typhoid and typhus fevers, after severe hemorrhages, phthisis, cancer, the various cachectic and wasting diseases generally—all these states induce in greater or less degree this condition of the blood. It is not true that so-called sthenic or inflammatory conditions alone produce hyperniosis and inopexia. Any cause that lowers the nutrition of the system is productive of such results. The fibrine factors are a lower grade of elaborated product, and their excess means impaired nutrition. Thrombosis occurring either slowly or rapidly in arteries or veins, but most in veins, is by no means uncommon. Cases of sudden death from alleged heart-failure in croup and diphtheria are often, no doubt, thrombosis of the right heart or pulmonary artery. It is believed by Tanner,

and with the many eminent clinicians, that central thrombosis is much more frequently a cause of death in croup and diphtheria than asphyxia, and the same may be said of pneumonia. The thrombus may form in some of the peripheral veins, and becoming dislodged be washed into the right heart or pulmonary artery. This is specially true in puerperal cases. Central thrombosis is not so common as other forms, but is found most in septic conditions of the blood, in parturient states and the exhaustion and debility consequent to fevers, hemorrhages, &c.

Barker says embolism and thrombosis of the right heart and pulmonary artery are more common in puerperal women than arterial thrombosis. It is more frequent also in primipara. Virchow thought thrombosis of the pulmonary artery was always secondary. It is certain, however, that it may not be embolic, but primary. The blood in cancer, phthisis and the cachectic states in general, is liable, especially if stagnated, to form clot and set up phlebitis, or to originate emboli and thrombosis of distant parts. Rheumatic fever induces a blood state which favors thrombosis. The thrombus is most apt to form at the junction of the deep and superficial veins, according to Paget. The vein may be partially or completely filled by the thrombus, the œdema and pain varying accordingly. Paget mentions a form of phlebitis occurring in gouty subjects which he calls adhesive. It is associated with thrombi; is most common in the superficial veins, and may entirely obliterate their calibre. The plastic deposit in these cases extends inward from the wall of the vein, and may extend a long distance, obliterating large veins, even the vena cava. It occurs sometimes in connection with thrombi that are disposed to suppuration and disintegration; they thus limit the diseased process and cut off from contamination the

general circulation. This organization of thrombi is much more frequent in arteries, but occurs in veins. Malarial fevers exert an influence on the vascular glands which lessens the red corpuscles and increases the white corpuscles and the pigment. With this state of the blood and a weak heart, clot formation is probable. The excess of pigment, coming mainly from the disintegration of the red corpuscles, causes embolic accumulation and capillary thrombosis. Thrombi under these conditions, if the heart is weak, are likely to form in the veins. We are led to infer, as we consider this subject, that venous thrombosis, both central and peripheral, is a frequent and often unsuspected factor in the history of the later stages of fever. In the thrombosis of peripheral veins the state of the blood plays the more important rôle. Cardiac weakness, usually present in such cases, is more potent in determining venous than arterial thrombosis.

Thrombosis following fever is most apt to occur in the left femoral vein. The reason is found in its course and relations. It is longer, more oblique and lies under the right common iliac artery in the upper part of its course, and is also subject to rectal pressure. The left femoral vein is also most often the seat of thrombosis in rheumatic phlebitis. In all these cases the femoral, popliteal and saphenous veins are most frequently involved, but the radial and brachial may be. Thrombosis of axillary vein is rare. Thrombosis in the peripheral veins is more liable to occur near valves than elsewhere. The thrombosis is more apt to disintegrate and give rise to emboli if near a junction with another vein. Thrombosis is entirely distinct from embolism, yet embolism is often a sequence of thrombosis. Dr. Fagge records a puerperal case that had had phlegmasia alba dolens, and she was suddenly seized with abdominal pain, collapse and death. No tympanites occurred. At the autopsy the heart was

found healthy, and a thrombus, or, more correctly, an embolus, had plugged the mesenteric vein. The portion of intestine corresponding was discolored and in incipient gangrene. Stokes reports a case of femoral phlebitis following typhoid fever. Patient was up and about the ward when he was suddenly seized with intense pain in the splenic region, elevated temperature, followed by symptoms indicating general phlebitis. The autopsy showed occlusion of the pulmonary artery in the later stages of fever and in puerperal states. Pain in the hip or deeply seated in the calf is indicative of mischief in the veins, and should lead to a suspicion of thrombosis, which may ultimately extend upward or give rise to emboli. It is asserted by Lidell, Trousseau, Druitt and others that the so-called metastases of rheumatic fever are of this character. Tanner calls attention to the so-called cerebral metastases occurring suddenly in some cases of rheumatic fever, and suggests that the stupor, embarrassed respiration, etc., seen in that condition probably result from embolism of the pulmonary artery or from thrombosis in the right cavities of the heart. Atlee reports a case of thrombosis of the femoral artery, ending in gangrene of the extremity, which followed unusual exertion. The femoral obstruction was preceded by signs of cerebral thrombosis. In another instance phlebitis of the popliteal vein was found after overexertion and exposure. In one of the daily papers of recent date I find the following:

A young lady of nineteen years, never sick in her life, did a large washing on Monday—presumably overexerted. On Tuesday morning, shortly after breakfast, was seized with pain in her foot; in three hours the pain had gone to her heart and she was dead; diagnosis, neuralgia of the heart. Was it correct? Tidy, in reviewing the causes of sudden death, says, "Embolism of the right heart or pulmonary artery may cause death very suddenly."

"The clot may be detached from the saphenous or femoral by very slight causes and swept along to the heart." Was not the pain in the foot caused by thrombosis in the veins of the leg at some point, the thrombus being subsequently detached, possibly by the frictions, etc., made to relieve the pain, and swept along to the heart? A much more probable conclusion than that neuralgia should destroy life in a young person with a perfectly sound heart. Niemeyer cites cases where clots from the femoral vein washed into circulation and occluded the pulmonary artery, causing death; also cases of pleurisy, with the same results. Frictions in phlebitis or phlegmasia of the periphery are to be avoided, because of the danger of dislodging clots and washing them into the general circulation. The same danger would follow active exertion. Weak heart and low tension in the blood-vessels is a prominent feature in the causes of thrombosis. In marasmic cachectic conditions, not only is the heart weak, but the capacity of the vessels exceeds the volume of blood, and a slow current results. This is an element of danger after hemorrhages and long fevers. It often happens if the dangers from thrombosis can be averted in exhausting diseases, the crisis may be passed in safety. Henoch reports a case of scarlet fever in a boy of seven, in which the vena cava inferior was converted into a solid fibrous cord by a thrombus extending upward from the iliac and peripheral veins. It was thought to be a marantic clot, due to cardiac weakness. When a thrombus forms from the feebleness of the circulation or from the state of the blood, it behaves differently than when it forms from disease or injury to the vessel wall. In cases of injury to the vessel wall, as in ligation or thrombosis from local lesion of veins, the thrombus organizes, first, by a growth of granulation tissue in place of the endothelium; second, by the pushing forward into the

thrombus of vascular supply from the outer coat of the vein. Thrombi, under these conditions, do not extend beyond the junction of the first branch in the vessel, while in the spontaneous coagulation and formation of thrombi, with secondary involvement of vessel wall, the thrombus may extend indefinitely.

Phlebitis and thrombosis of the vessels about the cranium are a common and important class of diseased vein conditions. Meigs reports a case of cerebral thrombosis in a young and previously healthy woman, caused by long-continued anxiety. Thrombosis of the cerebral sinuses, from blows or other injuries to the cranial vault, is common; central thrombosis often happens when the vessel wall is healthy, caused by the state of the blood or feeble circulation, or both. Coagulation is often extensive under these circumstances. It is not unfrequent after protracted bowel diseases of infants, and no doubt constitutes the condition many times known as brain complication, when the malady "goes to the head" and speedily snuffs out the little sufferer.

Henoch says thrombosis of the cerebral veins is frequent in the exhausting diseases of childhood and infancy. Lidell says there are four localities where the blood is prone to coagulate in debility, viz.: the cavities of the right heart, veins of the pelvis and lower extremities, and sinuses of the dura-mater. Inflammatory or peri-phlebitis in the venous sinuses of the brain is a common event in connection with many diseases about the head and face; lesions of the scalp, of the skull, or of the membranes of the brain often give rise to it. Scarlatina and erysipelas of the face and scalp are especially prone to originate it. Otitis usually sets up cerebral phlebitis through the medium of caries in the temporal bone. Pyemia may thus occur. Suppurative phlebitis arising in this manner may cause pyemia, constituting an instance where pyemia may

exist without external evidences. In that exceeding fatal disease, facial anthrax, and in lesions of the nasal fascia, thrombosis of the facial, frontal or temporal, or of the ophthalmic veins, may extend to the sinuses of the dura-mater and to the veins of the diploe. Marasmic or non-inflammatory thrombosis is not uncommon in elderly people, or after free venesection or hemorrhages, and as noticed in children after exhausting diseases. The uterine sinuses and ovarian veins are often the seat of thrombi, which may soften and give rise to pyemic abscesses in distant parts. This is most common after labor or abortions. The thrombus in these instances may arise from the entrance of septic material into the uterine veins or from peri-phlebitis of the uterine or ovarian veins, communicated by inflammation in the walls of the uterus or in the cellular tissue of the broad ligaments. Dr. Putnam-Jacobi found phlebitis with thrombi in the post-vaginal veins leading to the uterine sinuses. The lymphatics may be the seat of thrombosis, most common in the lower extremities and in puerperal states, and known as phlegmasia alba dolens. It is probable the condition rarely exists alone, but is connected with phlebitis. It may occur in the upper extremities and is not unfrequent after fevers. In phlegmasia, following typhoid fever, the pain and swelling are greatest over the femoral vein.

Stokes says the diseased process is identical with that which occurs in parturient women; occurring as a sequel, or in the later stages of fever, it is not always painful, and in any case the pain may be localized in a toe or in the foot or in the sciatic notch. Trousseau thinks the principal features of phlegmasia are the venous thrombosis and secondary phlebitis; the enteric irritation in fever and the uterine irritation acting as an exciting cause in either form. Phlegmasia is also a frequent, and sometimes the only prominent, sign of deep-seated visceral cancer in-

dicating its existence when no tumor can be felt. In all these cases the blood condition, the feeble circulation, and sometimes pressure on the veins in the cavities of the body are the determining causes. Compression of a vein causes thrombus. Some surgeons consider thrombosis and phlebitis as not uncommon results of surgical pressure on aneurisms, during amputations, etc. It is probable that phlebitis is not uncommon in the visceral veins. In obstructive disease of the liver, cirrhosis, etc., it has been observed that the œdema of the sub-cutaneous tissues of the abdomen was not dependent on the liver disease, but on phlebitis and obstruction of the vena cava ascendans.

In cases where meteorism and ascites were present without œdema, no disease of the vessel wall was found. The portal vein and its branches are the seats of thrombi, we believe, much more frequently than suspected. The suppurative form or pyle-phlebitis is induced by malarial and septic poisoning or visceral disease; also by hemorrhoidal inflammation, dysentery or other localized inflammation of intestinal tract. The chronic form of portal phlebitis will present symptoms almost identical with cirrhosis of the liver. The acute suppurative form has no bloating of abdomen or acitic collection, but is accompanied with chills, sweats, diarrhœa and phenomena like that of pyemia. It would be interesting to discuss the relations of phlebitis to pyemia, also to review the treatment of these conditions; but space forbids, and we will only say that in the treatment of thrombosis in general, and especially in those forms occurring in connection with scarlatina, diphtheria, rheumatism and other fevers, carb. of ammonia will be found useful, because of its power to lessen coagulation and to stimulate the action of the heart—two very important factors in these conditions.

THE USE OF JEQUIRITY IN GRANULATIONS.

BY C. W. TANGEMAN, M.D., CINCINNATI, O.

From the opportunity that the general practitioner has had of informing himself on the use of jequirity, I think it wholly unnecessary to spend any time in giving the history of this drug. Two or three years ago all of the general journals were filled with reports of the uses, action and abuses of this agent. New remedies are introduced by the score, but for some reason very few of them are found to be practical and efficient. Our object to-day is to show to the profession how nearly that became the fate of jequirity, the manner in which it was averted, and the range of usefulness of this drug to-day. We can make the sweeping assertion that there never was, in the history of medicine, an agent that became general property in so short a time.

To judge from the printed reports a few years since, one would infer that the entire profession had turned eye specialists. This demonstrates to the reasoning mind at least two things, namely, that there was a demand for a remedy of the nature that this was said to be, in every country or clime, and in every man's practice; and, second, that every man was ready to use it. There was only one thing to be deplored, and that was that the drug was given to the world prematurely, before its action clinically had been carefully studied. Warlemont, in the earlier part of the nineteenth century, introduced the practice of treating old granulations and inveterate pannus by inoculating the conjunctiva with gonorrhœal virus, in other words, by setting up a purulent inflammation.

In the majority of cases the inoculated eye, and only too often its healthy fellow, was destroyed by the severity of the acute inflammation. DeWecker, when he introduced jequirity, substituted hearsay for clinical observation. He was told that jequirity cured granulations; furthermore, that it always set up an acute purulent inflammation. He at once hastily concluded that its good effects lay in the fact that it caused a purulent inflammation or conjunctivitis. The larger majority of you certainly recall the directions given for the use of this agent: apply it until it has caused a purulent ophthalmia. The mode of applying the agent was to take a number of beans, bruise them to a powder, and macerate for thirty-six hours in warm water. The infusion was now ready for use; it was applied to the everted eyelids by means of a brush a few times daily, or sufficiently often to produce the desired effect—a purulent ophthalmia. Under ordinary circumstances the cornea and conjunctiva are not easily affected by germs floating in the atmosphere or lodging on its surface, but in the above instance you must remember we were applying daily, yes, hourly, a fluid that swarms with a bacillus (we are not able to say what its history or character). At first it was thought that this microbe was the specific agent that cured granulations, but this was soon proved to be a fallacious theory. In the fact that purulency or an infection, until there was a flow of pus, was produced, lay the explanation for the bad results published. There never was a bad result put on record where there was no purulency, or, in other words, there never was a bad result from the use of jequirity where the doctor was not to blame, because he employed the drug improperly. We cannot produce purulent ophthalmia or set up an inflammation severe enough to do the patient any harm with a sterilized infusion of jequirity. What conclusion do we draw from this observation? It can

only be one, viz., that the intense painful reaction and the production of pus and all of the bad results reported were due to the use of a decomposing vegetable substance.

The cornea ulcerates, sloughs, the lids drop off, the bones of the orbit necrose, and to prevent sympathetic ophthalmia, Galesowsky has been compelled to enucleate the affected eye. An infusion of jequirity into the abdominal cavity of some of the lower animals causes peritonitis and death, while the spleen, liver and blood are filled with the same microbe that can be found in the infusion.—Sattler. Is it not more than likely now, from all of these observations, that the purulent inflammation, the bad result of some of the observers, the death of the animals spoken of above, were all due to the same poison, namely, the decomposing infusion that you were recommended to use on the conjunctiva? It is certainly contrary to all reason to apply such a fluid to a surface as we find the conjunctiva to be, in granulations.

Summing up all observations, there seems to be but little doubt that all of the bad results produced can be accounted for in this manner. And if the infusion had contained no other active principle, its fate certainly would have been regretted by none. Not long after the introduction of jequirity into this country, careful observation taught us that the theory of its action was erroneous, that the method of application was faulty and dangerous in the hands of specialists even. Some French pharmacists, acting on the supposition that the jequirity bean contained an alkaloid, attempted the extraction of this principle, but if such a principle existed it was destroyed by the process of extraction. The agent was inert when applied to the conjunctiva. About this time the pharmaceutical house of Parke, Davis & Co. made a preparation called fluid jequirity, the menstruum of which is eighty per cent. of glycerine and twenty per cent. of water. It is but slightly

irritating to the eye, but is quite efficient; and we can say without reserve it can be employed in any eye with absolute safety. It is not a specific nor must it be treated as such, but you can all understand that it would act better in the hands of a physician who knows how, when and where to apply it. There never was a more true observation made than was suggested by Professor Seely, when we employed the infusion, that there is a certain amount of insult to the conjunctiva that is wholly unnecessary; it even does harm. Purulency is not a requisite, as can be proven by the use of the glycerine preparation. What the nature of the active principle, its method of extraction and its mode of action, is not definitely known. Clinical observation has taught us that it is a safe remedy. Its range of application is gradually increasing. Everyone who is familiar with the disease called granulations will remember that the most annoying cases (to the patient as well as the physician) are those in which we have corneal complications. It appears to matter little whether it is the pannus, due to irritation, as it is termed, or the cornea is studded with small ulcers, an application of jequirity has the effect of contracting the blood-vessels and restoring the lymph circulation in the cornea on which this structure is dependent for nutrition. Opacities and infiltrates are absorbed, restoring the transparency and usefulness of the cornea, often when all other remedies have failed. Heretofore this action was accounted for by the presence of a purulent inflammation, as in Warlemont's or DeWecker's method. It is my firm belief that jequirity, employed in acute granulations, hastens the disappearance of an attack and protects the cornea. More recently jequirity has been employed in the various forms of corneal ulceration, pure and simple. It may be employed by brushing the inner surface of the eyelid, or in children by dropping it into the eye as any other topical agent.

While it is not our object to make converts to the use of jequirity, permit me to ask one single leading question: Who is there present that is satisfied with the old plans of treating this disease?

There certainly are not many anywhere. That jequirity is an efficient agent nobody denies, but since so many bad results were reported, it becomes necessary for the specialist to assure the general practitioner that the agent is perfectly safe in the manner and shape in which it is now put up. To the general practitioner belongs the treatment of these cases, and to him the large majority apply for treatment; therefore his interest in remedies for the relief of these cases. The application is easily made. The lids are everted and by means of a cotton-wrapped probe you brush on the drug. If the application is made in the morning, by evening the lids become a little puffy, there is watery discharge, some pain and sensitiveness to light. Twenty-four hours after the first treatment the discharge is more mucous, containing shreds of lymph, the conjunctiva is inflamed and covered with a false membrane in many instances. If these symptoms are well marked a second application need not be made until all symptoms of the artificial inflammation have passed away, which may require a week or two. If now you find that a second treatment is required, make it the same as the first. As above stated, jequirity is especially indicated where there are corneal complications. Where the cornea is covered with blood-vessels coming from the upper sclero corneal border, at times a single treatment is sufficient to demonstrate a difference in the acuteness of vision to the patient. My excuse for bringing up this subject, if it require one, is to show, in the first place, that jequirity, in the form in which it is applied now, is perfectly safe; and, secondly, far superior to any agent in use at the present time for the treatment of granulations or corneal opacities.

DISCUSSION.

Dr. X. C. Scott of Cleveland said:

I have used jequirity occasionally, and I put about five or ten grains of boracic acid with it, that is, to the ounce of the solution. I have this solution made by pulverizing five or six beans and then macerating this mass for twenty-four hours in a half ounce of distilled water, filter and add boracic acid, and it has kept then two or three weeks. I would consider it one of the best medicines I have in treating granular lids. It is so much safer than gonorrheal pus that there is no comparison. I think I have used it in twenty or thirty cases, and I have had but two cases where I had any unpleasant effects, and they were only slight ulcers and they soon passed off. I have had several cases where I got along in two or three months, where it would have taken two or three years with the ordinary treatment, and perhaps then failed.

Dr. A. R. Baker of Cleveland said:

I regret not having been present to hear this paper read, as I should like to have said a few words in this discussion. My experience with jequirity has not been so favorable as that of the gentleman who has just left the floor. The first case in which I used it was that of an old Irishman who had granular lids; there was some purulent discharge at this time. I used a two per cent. solution, and made only one application, and it set up the most intense purulent ophthalmia I ever saw, resulting in a perforation of the cornea, and the eye was lost. This experience with this old gentleman has made my life generally uncomfortable ever since, as I have been threatened repeatedly with a suit for malpractice. It has also served to make me suspicious of jequirity.

I must confess that since this case I have used this drug with great care; possibly with too much care, so that as a rule I have not seen much benefit from its use. I believe there is a field of usefulness for jequirity, but an extremely limited one. Most cases of granular lids can be treated better and more safely with other preparations. In those exceptional cases in which the older eye-surgeons sorted to the use of purulent inoculation, we have an

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ACUTE FOLLICULAR TONSILITIS.

BY STARLING LOVING, M.D.; COLUMBUS, OHIO.

Acute follicular tonsilitis, acute lacunar tonsilitis, or, as it is more frequently called, diphtheritic sore throat, ulcerated sore throat, and diphtheroid sore throat, is an acute, and (as I think) specific, infectious, febrile disorder, known everywhere, but, seemingly, particularly prevalent in the central portions of Ohio. Every general practitioner within a radius of sixty miles of Columbus sees and treats numerous cases each succeeding autumn, early winter and spring—the periods of the year when the weather is variable and cool, and when many specific and contagious febrile diseases prevail.

The malady has been described by various writers, general and special. It was described by Maygan of France as early as 1818, and since by Wagner, Austin Flint, Bosworth, Jacobi and others. In Flint's work on Practice its symptoms and course are briefly but accurately described. The author says nothing in regard to the possibly specific character of the disease, but he calls attention to the importance of making a clear distinction between it and diphtheria, for which it is so frequently mistaken. Bosworth, in his book on Diseases of the Throat and Nose, gives a more extended and a good description of symptoms, course and treatment, and states that there may be reasons for supposing it to have specific character, but that he does not think it is contagious. Jacobi (N. Y. Med. Record) thinks

it is a mild form of diphtheria. Solomon Solis Cohen, in the Archives of Pediatrics, calls it diphtheroid sore throat, or drain sore throat, a hint, at least, of specific origin.

As it is not of the class of diseases usually brought to their notice, it is not strange that specialists should pass it with but brief notice, but it is somewhat remarkable (if the disease is as common elsewhere as in the central portion of Ohio) that writers on general practice have not given it more attention. Altogether, the literature, though somewhat extensive, is not wholly satisfactory.

The greater number of its subjects are children from two to twelve years, but it frequently attacks youths, and adults young and of middle age. Nursing infants and old people are mostly exempt, but in each class an individual suffers now and then. It attacks all classes, the well-to-do and comfortable and the poor alike.

It more frequently attacks people in good general health than such as may be already suffering from other troubles, diseases of the throat included, for the reason that invalids are perhaps less apt to be exposed anew to the causes of disease, common and specific. It is more apt to prevail in villages, towns and cities than in the open country, and it is found with certainty in houses with bad drainage and ventilation. In many houses with the modern improvements (so-called), as stationary wash-stands, bath-tubs and water-closets in or attached to bed-rooms, it is found often and at all seasons of the year, along with pharyngitis, diphtheria, diarrhœa, dysentery, and bronchitis, one or all.

It cannot be demonstrated that the disease is specific, but its general course resembles closely the course of diseases known to have specific character. The chill, quickly followed by fever; the eruption in the throat,

always the same; the tendency toward the epidemic form; and the uniform termination, taken together, give it at least distinctive features. Neither can it be asserted positively that it is contagious; but the rapidity with which new cases are developed after the first has appeared in a family or a neighborhood, impresses the belief that it is conveyed, like scarlatina and diphtheria, by infection. When a case appears, it is followed, with great certainty, in from four or seven days by others. This is more noticeable when the family is large, or when the disease appears in a school or reformatory. After the history of an apparently sporadic case discloses exposure to contagion. And the tendency toward the epidemic form, already mentioned and so frequently manifested, shows further resemblance to the infectious group of febrile diseases. One is constantly reminded of the similarity between its general symptoms and those of a type of acute coryza, speedily followed by bronchitis, which prevails at the same seasons, particularly in the late fall and early winter, which, though by many is attributed to atmospheric vicissitudes, is thought by some good authorities to be contagious. The general symptoms of febrile tonsilitis never vary except in intensity, and the local symptoms are uniformly symmetrical. In some cases, in the beginning, one tonsil only is affected, but the other is certain to become involved before the end. The course of the disease is not arrested nor materially altered by any mode of treatment.

Taken together, the facts stated seem sufficient to the opinion that it is an individual disease, arising from a specific cause, and that it is entitled to rank as such. Its individuality is as clearly defined, and it is not less important than many other maladies which have long been assigned to classes and orders. It should have a place

in the classification of diseases to distinguish it from diphtheria, if for no other reason.

The nature of the cause can be conjectured only, but from the history of the disease, or rather of the circumstances under which it arises, it may be inferred that the contagium, like the contagia of diphtheria, measles, scarlatina, and other acute infectious disorders, originates in the human body, and that it is diffused through the same agencies as other infections. It thrives where there are accumulations of filth; where the air is foul from bad ventilation; from overcrowding; defective drainage; sewer gases, or from all combined. As before stated, it is seen frequently in houses with "modern improvements." Many such houses, marvels of fancy carving, upholstery and of plumbers' work, have faulty or no ventilation, and are constantly permeated, through the "improvements," by the most noxious emanations from sewers. A dozen or more persons may contract the disease almost simultaneously by sitting for an hour or two in an overheated, poorly ventilated and crowded hall or theatre. In short, every circumstance connected with the origin and spread of the disease points to specific character, and to a living contagion, but the special microbe has not yet been discovered nor delineated.

The course of the malady is nearly uniform. The symptoms, as of other maladies, vary in intensity, but in other respects are in all cases essentially the same. In occasional cases there is a prodromic stage of feverishness, lassitude, and general discomfort, lasting a day or two, but in the greater number the onset is sudden. There are rigors, often a pronounced chill, speedily followed by fever, ranging from 102°, 103°, to 104° or 105° Fahrenheit; flushed face, more or less intolerance of light, headache, neuralgic muscular pains in the loins and extremities, most severe in the legs.

and loins, but unpleasantly so in the arms and shoulders, a feeling of weariness and prostration, an accelerated pulse, varying from 100 to 120 per minute. The tongue is coated with a thick whitish-yellow fur, the appetite is diminished or lost, there is thirst, and occasionally, but occasionally only, there is nausea and vomiting. The skin is hot and dry, but not, however, so devoid of moisture as in some other febrile disorders. The urine is scanty and high-colored, and, rarely, albuminous. The bowels are almost uniformly constipated. Following the chill and fever, sometimes preceding those symptoms, patients complain of sore throat and difficulty of swallowing, usually not severe, but seldom absent. In rare cases these symptoms are not developed until twelve or fourteen hours after the accession of fever, but they appear sooner or later. On examination, the tonsils, one or both (more commonly both), are found inflamed and swollen, with bright red surfaces, while the surrounding parts are hyperæmic, but not inflamed. The crypts of the tonsils are prominent, and from three to ten of them are covered with a yellowish-white exudation, which extends a short distance in all directions around the openings of the follicles over the surrounding mucous membrane. This exudation is in most cases distinctly circumscribed, and confined to the outlet of the follicle and its immediate vicinity. It is easily removable, and after the first thirty hours from the beginning of the attack, if scraped away, is not replaced—a circumstance of considerable value in enabling one to distinguish between this form of tonsilitis and diphtheria.

If a patch of the exudation be taken away during the first twenty-four hours, the opening of the follicle underneath will be seen enlarged and filled with the same material, which, apparently, is still in process of formation, and the patch may be reproduced; but after thirty or

thirty-six hours (sometimes in twenty-four) the progressive stage appears to end, and when the false membrane is removed, the surface underneath remains clean and red as before the effusion commences. Contrary to what is so generally seen in diphtheria after a similar operation, there is no bleeding, nor does the surface of the mucous membrane appear torn and eroded. On the second day the exudation is greater than at first, and more distinctly circumscribed; on the third day it begins to disappear, and by the fourth, generally, it is gone, leaving the tonsils and the parts immediately surrounding smooth, red, and sensitive as before exudation began. During this stage the patient complains more of pain and of difficulty of swallowing (never so great as in some other diseases) than before. In occasional cases, owing possibly to severity, or to idiosyncrasy, the exudation is more extensive than has been described, the patches are larger, so that two or more may coalesce and form a deposit more nearly resembling that of diphtheria, but it is never so extensive, is always thinner, is confined to the tonsils, and instead of being densest in the centre, shows two or more points over the involved follicles, is thinnest at the point of junction, and, as before stated, may be removed without exciting hemorrhage. At any time during the existence of the exudation a probe may be passed through a patch into the dilated and inflamed crypt behind it—a circumstance which may be considered as almost distinctive.

On the third or fourth day, in slight cases on the second day, frequently after a quiet sleep, the temperature sinks to the normal, the skin becomes moist or wet with perspiration, the pain in the head and muscles subsides, there is no longer restlessness and general discomfort, the exudation disappears, leaving a red surface which soon becomes paler, the swelling of the tonsils diminishes,

the pain in swallowing subsides, the appetite returns and convalescence begins.

In addition to the symptoms already described, in an occasional case slight swelling of the glands at the angles of the jaws is observed, and, in about the same proportion, swelling of the sub-maxillary glands, one or both. More frequently, however, if there is any external tumefaction, it is in the tonsils, which, in some cases, become quite prominent, but the tumefaction is not so great as is often seen in connection with ordinary tonsilitis, and it disappears soon after the subsidence of the fever.

There is sometimes stiffness of the neck, but never any considerable infiltration of the tissues so often seen in diphtheria, scarlatina, and from deep and diffuse ordinary tonsilitis.

Convalescence is frequently tardy, the patient remaining weak and disabled many days after the disappearance of all active symptoms, but it is eventually complete. The tonsils sometimes, but not uniformly, nor in the majority of cases, remain enlarged and irritable.

The most important point in the consideration of acute follicular tonsilitis is its diagnosis. It is especially important that it should be accurately discriminated from diphtheria, for which it is so frequently mistaken. Neither disease has pronounced prodromic symptoms. Such, when present, are more apt to precede diphtheria than tonsilitis, and to be more decided. Both diseases begin with rigors or with a decided chill (both rigors and chills more distinct often in tonsilitis), followed by fever, highest often in the milder disease. In diphtheria the temperature, even in severe cases, may not exceed 102°, or 103°, Fahrenheit, while in mild cases of tonsilitis it often reaches 104° Fahrenheit. In both, with the fever, there is headache, muscular pains and disordered functions—all of the symptoms common to the febrile state—but in diphtheria,

the fever and its dependent symptoms, though not more severe, are longer continued and do not terminate so suddenly. The local symptoms of tonsilitis differ somewhat from those of diphtheria, even before the appearance of the exudation. The inflammation is confined to the tonsils, both of which, in the larger number of cases, are affected simultaneously and in equal degree, and shows no tendency to spread to other parts, as is so often the case in diphtheria. The entire pharynx is hyperæmic, but the tonsils alone are inflamed. In diphtheria the inflammation begins oftenest on the tonsilar surfaces, but not unfrequently it appears at the same time at other points. The diphtheritic tonsil is darker colored, has a smooth, glistening appearance, as though coated over with some transparent varnish; has, here and there, irregularly distributed, somewhat elevated shining points, which are said by Oertel to contain colonies of micrococci, and to be highly diagnostic. The pain at this stage is often more severe in the milder disease. The exudation of follicular tonsilitis appears at several points over the openings of such of the crypts as may be involved, and seldom extends much beyond. It consists of whitish-yellow flakes, more or less circular in shape, easily detached, and after twenty-four or thirty-six hours, is not reproduced after removal. The detachment of these flakes is not followed by bleeding, as happens when the false membrane of diphtheria is separated by force. The exudation never changes color, or at least never becomes darker.

The exudation of diphtheria appears at one, or at three or four, points on the inflamed surface, and spreads until frequently the tonsil and the neighboring parts are covered. It is thickest in the centre; is homogeneous; is at first ivory white; becomes grayish, afterwards gray, and, when sloughing begins, blackish, or black, especially at the lges, from the oozing of blood from the ulcerated mucous

membrane underneath. If the detached membrane is examined by the microscope, it is found to contain bacteria (micrococci) in vast numbers. If the exudation begins at two or more points, the patches soon coalesce. It is often at first confined to one tonsil, or other part of the throat, but is pretty certain to appear on the other side before the termination of the case. Moreover, it frequently begins simultaneously upon the tonsils and soft palate, and quickly extends to the nares, or the whole throat may be involved from the first. In a large proportion of cases, unfortunately, the larynx and trachea become implicated. Such cases are often seemingly mild, and the inflammation does not descend to the air-passage until after the acute stage in the parts above has passed.

The deposit (so-called) of diphtheria consists of fibrine, leucocytes, and the epithelial portion of the mucous membrane, which undergoes necrosis before the separation. The exudation of follicular tonsilitis consists of the changed secretion of the crypts of the tonsils, with an admixture of fibrine exudate. It is seldom seen on any part except the surface of the tonsil, never on the soft palate. Nor does the disease ever extend to the nares, to any portion of the respiratory tract, properly so-called, nor does it ever appear to affect distant parts of the body, as happens in the progress of diphtheria.

All who have watched the progress of diphtheria have learned to dread relapses. In many cases when every indication seems to point to recovery, there will occur a rigor, an accession of fever, an increase or renewal of pain in the throat, and fresh membrane will appear, not unfrequently in a new locality. Relapses never occur in tonsilitis, nor does the exudation ever reform after having fallen away.

Convalescence from diphtheria is generally slow and frequently imperfect; from follicular tonsilitis, it begins

immediately upon the cessation of fever, and though sometimes tardy, is finally complete. There are no sequels, such as hemorrhages, swollen glands, abscesses and paralyses, which, unhappily, are often seen after diphtheria. Occasionally, in persons predisposed, the inflammation is followed by abscess of the tonsil; and now and then it extends through the eustachian tube to the middle ear, but neither complication occurs sufficiently often to be regarded as more than an accident.

In some cases of scarlatina, previous to the eruption, the condition of the tonsils and pharynx resembles very closely that present in follicular tonsilitis, but there is usually less of swelling in scarlatina at the beginning; the inflammation is more diffused, and the sloughs on the tonsils, though they may appear at separate points, increase rapidly and soon coalesce; they are always larger, more irregular in form, and of darker color—gray, or grayish, instead of yellowish-white. Should any doubt remain after examination of the throat, the great frequency of the pulse, the pungent heat of the skin, together with the cerebral vomiting, all so characteristic of scarlatina, will assist, and the appearance of the eruption will finally decide the nature of the case.

It is not likely ever to be confounded with measles, but it is now and then intercurrent with that malady.

Common catarrhal tonsilitis is always sporadic; is pretty uniformly confined to one side; is as likely to occur at one season as another (McKenzie states that in England it occurs most frequently in summer), and is never attended by the formation of false membrane or exudation.

Common membranous sore throat, or herpetic sore throat, is distinguished by the appearance of herpetic vesicles upon the tonsils, pharynx, and now and then upon the soft and hard palate, "isolated or in groups, and surrounded by zones of inflammation," and by the appear-

ance, in many cases, of similar vesicles at some part of the inner surface of the cheeks, lips, at the corners of the mouth, or upon the face; and by the fact that when the vesicles burst they are followed by the formation of a grayish-white or yellowish-white exudation which soon extends and not infrequently covers the whole tonsil and the neighboring parts. Alternations sore throat may generally more pronounced and more decided prodromic symptoms.

The history and the absence of decided febrile symptoms suffice for the diagnosis of cases in which the tonsils have become inflamed from syphilitic infection.

The prognosis is uniformly favorable. It is therefore a great comfort when a clear diagnosis has been made for the physician to be able to assure the patient and his friends that no danger present or future is to be apprehended and that the fear which is always excited when there is exudation, however small, in the throat is entirely groundless.

A careful scrutiny of the case should however precede before such favorable prognosis is expressed. [illegible] the physician [illegible] with diphtheria and syphilis, or some other of the [illegible] which [illegible] of that malady [illegible] the original case has been [illegible] and other cases [illegible] a [illegible] examination might be [illegible].

In the [illegible] of the [illegible] for the [illegible] severe [illegible] and great [illegible] [illegible] [illegible]

not infrequently made; and the consequences are occasionally sufficiently grave.

When, as now and then happens, one hears of a hundred or so cases of diphtheria, which have been treated by ordinary or extraordinary methods, all terminating favorably, there is room to suspect that there has been a mistake in diagnosis, and that erroneous prognosis has been based thereon. Statistics founded upon such basis are faulty and unsafe.

The indications for treatment are simple, and consist in the application of suitable means for the reduction of temperature, and the relief of suffering. Moderate doses of aconite, with morphine, codeia, or the tincture of ipecac and opium, suffice better than other medicines to meet those indications.

A warm bath or warm pack will materially assist in reducing the temperature, and in soothing restlessness.

A mild laxative is sometimes indicated, but the stronger cathartics should be avoided.

Ice and iced drinks will quench thirst and help to quiet the pain in the throat. Gargles of salicylic acid, boracic acid, solution of chlorinated soda, or Dobell's liquor, amuse the patient, if they do not modify the progress of the malady. A rather weak solution of the sodium bromide, useful always in diphtheria, seems to give comfort and even to promote recovery.

It is perhaps better, though not always practicable, to use a spray apparatus for the application of the local remedies rather than have the patient attempt the operation of gargling, which, to say the least, is ungraceful.

If the patient be much enfeebled and convalescence is tardy, a mild, bitter tonic, associated with the citrate or tartrate of iron, will prove beneficial.

TEN CONSECUTIVE CASES OF ABDOMINAL SECTION FOR THE REMOVAL OF THE UTERINE APPENDAGES FOR THE RELIEF OF PELVIC PAIN AND THE RECURRENT ATTACKS OF PELVIC INFLAMMATION.

BY RUFUS B. HALL, M.D., CINCINNATI, O.

The ten cases of abdominal section presented in this paper include all of the operations I have made for the removal of the uterine appendages since September 20, 1887. Nine of the cases recovered; one died. The histories of the cases of inflammatory diseases of the ovaries and tubes are so different from the histories of patients suffering from large tumors, and there are so many different symptoms connected with the diagnosis in these cases, that I have thought a short report, treating of the conditions for which the operations were performed rather than of the details of the operations themselves, might be of interest to you.

Case I. Mrs. A., Ritchie county, West Virginia; patient of Dr. Scott of Parkersburg; aged 33; married eleven years; mother of one child; had two miscarriages, the last eight years ago; at which time she had an attack of peritonitis, since when she has been an invalid. For two years before the operation she was confined to her bed almost constantly; the only time she could be up was the last few days just before her menstrual periods. Almost every period for the past two years was followed by an attack of peritonitis. She suffered constant pain and was in a wretched state of exhaustion and emaciation;

her weight would not exceed ninety pounds, when her former weight had been one hundred and thirty. Operation made at my "Home" September 20, 1887; removed both ovaries and tubes; firm adhesions; right tube contained pus; recovery; present, Drs. Hanley and Lash of Chillicothe, Ohio. Now, twenty months after the operation, she is in perfect health, and has been so for many months.

Case II. Mrs. C. A., patient of Dr. Andre of Piketon, Ohio; aged 41; married nineteen years; mother of three children, the youngest ten years old. After the birth of her last child she suffered from an attack of peritonitis, and ever afterward complained of pain in the left inguinal region. Fully half of the time, for two years before the operation, she was confined to her room, and much of the time to her bed.

The operation was made at my "Home" November 16, 1887. The left tube was adherent and distended with pus to the size of a small orange. Right tube was firmly adherent and thickened, but contained no pus; recovered without a bad symptom and now enjoys perfect health. Present, Drs. Andre and Barry of Piketon, Ohio, and Dr. Barnes of Chillicothe, Ohio.

Case III. Mrs. J., aged 31, of Frankfort, Ohio; married twelve years; no children; no miscarriages. About one year after her marriage she had an attack of pelvic inflammation, from which she did not fully recover. This condition, with exacerbations of pelvic pain and inflammation, continued until 1886, when she had another attack of pelvic inflammation, and from this time the pain steadily grew worse. She had had all kinds of local and constitutional treatment for years without benefit. I was consulted in March, 1888. Examination revealed a small tumor behind the uterus. It was extremely sensitive, causing the examination to be attended with much pain.

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small orange, and the uterus was quite firmly fixed. There was no sinus to be found opening into the vagina, but by pressing over the tumor pus could be made to exude from the cervix. Diagnosis: pyosalpinx discharging into the uterus and an operation for the removal of the tube advised. She was brought to my "Home" upon a cot-bed September 1, and the operation performed September 5. The left tube was firmly adhered and dilated to the size of a small orange and filled with pus. The right tube also contained a small quantity of pus and was removed. She rallied from the shock better than one could hope for, considering her feeble condition, and continued to do well for three days, but on the fourth day she developed peritonitis and died thirteen hours after the first symptoms of inflammation were manifest. Present, Drs. Van Meter and Elrod of Cincinnati.

Case V. Mrs. W., Bainbridge, Ohio, aged 27, married five years, no children, no miscarriages. Had always suffered great pain at her menstrual periods. About one year ago she had typhoid fever; since that time she has had constant pelvic pain, and has had two sharp attacks of pelvic inflammation, and now spends half of her time in bed. By vaginal examination a mass can be felt at either side of the uterus, which is painful to the touch. She has lost flesh and is much debilitated generally. Requires morphine in large doses several times a day to relieve pain. Operation at my "Home" November 3, 1888. Both ovaries and tubes were adherent, and tubes contained pus. She made an uninterrupted recovery, and now, six months and a half after the operation, is in perfect health. Present at the operation, Drs. Elrod and Van Meter of Cincinnati.

Case VI. Miss J., aged 27, caught cold in her menstrual period in May of last year, and had an attack of peritonitis. About six weeks afterwards, when she had

recovered so that she was able to leave her room, she had a relapse, and was never able to leave her bed until after she recovered from the operation. The uterus was fixed, and upon each side a mass could be distinctly felt as large as an orange. She suffered constant pain and required large doses of morphine several times a day to make her condition tolerable. She was very much emaciated, and had constant fever, and it was plainly evident that she must soon die unless she could be relieved. Operation at my "Home" November 22, 1888. Both ovaries were found adherent, and both tubes contained pus, and both were removed. Present, Drs. Van Meter and Elrod. Recovered, and was able to go home in five weeks.

Case VII. Miss L. V., aged 22. Fifteen months ago she had typhoid fever; ever since has complained of pain in the inguinal region on both sides, which has increased in severity from month to month. For six months she has had constant local and constitutional treatment of the most approved kind, with no relief. She is unable to stand erect owing to dragging pain in the abdomen, which is somewhat relieved by stooping forward. For this reason she walks with the body inclined forward. Examination reveals a mass upon either side of the uterus. Operation at my "Home" December 27, 1888. Both ovaries and tubes were found adherent, and the left tube contained pus. The right was in such a diseased condition that it was also removed. Present, Drs. Elrod and Van Meter. She made a rapid recovery, and went home on the twenty-sixth day after the operation, and is now in perfect health.

Case VIII. Mrs. H., Covington, Ohio, aged 39 years, one child, seventeen years old, patient of Dr. Scofield, and was seen in consultation with that gentleman March 8, 1889. She gave a history of having had an attack of abdominal inflammation four and a half years ago, and

since then has always suffered pain at the menstrual periods. At each period she was confined to her bed from eight to ten days, suffering great pain. Six months ago she had an attack of peritonitis, and has been confined to her bed ever since, requiring the daily attendance of her physician. Examination revealed an enlargement upon either side of the uterus, was extremely sensitive to pressure. Considering the fact that she had had the best local and constitutional treatment for months, I advised an operation, which was made at my "Home" April 13, 1889; double pyosalpinx. The right tube contained three and one-half ounces of pus, the left one-half ounce. Recovered, and went home the thirtieth day after the operation. Present, Drs. Van Meter and Elrod.

Case IX. Mrs. M., aged 27, married ten years, two children, the youngest seven years old, patient of Dr. J. S. Caldwell of Cincinnati. She had an attack of peritonitis after the birth of the last child, and has never been free from the pain one week at a time since. The pain is always worse after the menstrual period. She locates the pain in the inguinay regions. Ten months ago she became worse, and suffers constant pain since, which can only be relieved when under the influence of morphine. Examination reveals an enlargement back of the uterus and to the right side. She had had constant local and constitutional treatment for many months, and was growing worse constantly. She was advised to submit to an operation, which she did May 6, 1889, and a double pyosalpinx removed. Patient is now convalescent, and will soon be well. Present, Drs. Van Meter, Elrod and Caldwell.

Case X. Mrs. L. S., patient of Dr. Fishburn of Cincinnati, aged 25 years. Twenty months ago had a miscarriage and an attack of peritonitis afterward. Says that she has never seen a well day since, but she was able to do light

housework and the [illegible] He was had constant medical attendance [illegible] received no benefit but [illegible] were adverse. When she applied to Dr. [illegible] in August [illegible] serious trouble in [illegible] he [illegible] revealed a fundamental [illegible] which was very [illegible] advised [illegible] and a [illegible] easy recovery. [illegible] after the [illegible] Carson [illegible]

[illegible]

[illegible]

[illegible]

bed-ridden. They all gave a clear and unmistakable history of *abdominal inflammation*, not only one attack, but many. All date the commencement of their illness to an attack of inflammation of the abdomen. In all could be felt, by the bimanual examination, an enlargement upon one or both sides of the uterus, tender upon pressure, which could not be pushed upwards. All the cases proved to be pyosalpinx except one, of abscess of the ovary. In all the cases the adhesions were firm and extensive. The pain in these cases is due to the pathological condition actually present, and while that remains unrelieved it is obvious that relief can be only temporary. The retroflexion and other misplacements of the uterus met with in all of these cases were a natural result following the repeated attacks of inflammation, and could not be cured by any local application made to the uterus. The cases illustrate the benefit of operative interference in chronic inflammation of the uterine appendages. In looking over the text-books on diseases of women we find long chapters on the displacement of the uterus and pelvic cellulitis (so called), which are discussed with great care and the most trifling detail dwelt upon and elaborated to the fullest extent; while the more important subject of inflammatory diseases of the fallopian tubes and ovaries has been treated as of but little importance. While it is true that some of the most recent works devote a short chapter to this subject, most of them dismiss it with a few words. I am glad to say, however, that some of the German authors of recent date give minute and complete description of the pathological anatomy of the tubes, showing that they already realize that it is a subject worthy of their careful consideration.

It is this scarcity of literature on the subject that has ed me to inflict upon you this extended and tedious eport. With my limited experience I will not theorize,

but simply offer this report as a small contribution to the fund of knowledge that may in time dispel the misty obscurity that envelopes the subject of diagnosis of inflammatory diseases of the uterine appendages.

154 W. 8th St.

DISCUSSION.

Dr. Reuben A. Vance of Cleveland said:

The very instructive paper we have just listened to, while a faithful *résumé* of clinical experience, would certainly lead us astray were we to consider it a type of the class of cases falling under the eye of the surgeon demanding operative relief. It includes too many instances of pelvic peritonitis—it matters not from what cause produced—in proportion to pelvic cellulitis, to be a reflex of practical every-day work. Those of us who have watched the varying views of authors who have discoursed on the diseases of women—particularly those of a surgical character demanding operative or mechanical relief—have not infrequently had occasion to smile at the influence of fashion even in this secluded domain. At one time inflammation of the neck, with ulceration and engorgement of the uterus, was the potent factor in the diseases peculiar to women; the logical answer to the pressing therapeutical problem was then found in the speculum and local applications. Then the mechanical school came on the scene—and who has not familiarized himself with their pessaries innumerable and their seductive doctrines of displacement and defective drainage? A reaction that can be traced to the New York State Hospital for Diseases of Women gave an exaggerated importance to a mysterious cellulitis, and any defect the practitioner might note in the ordinary signs of what a surgeon would call cellulitis, was more than compensated by the deluge of hot water with which the penetralia of the sufferer was flooded, until the disease was washed away. Then came an operating era: one owing its popularity to the marvelous success of Lawson Tait, but one in which disciples often lagged far behind the master in the record of cured cases. And just as past waves of practice bore on their

crest some doctrine of morbid anatomy that was appealed to for a justification of the therapeutical procedures popular at the moment, so now we have a doctrine that is to prove the key to female pelvic pathology and justify ambitious operators in opening the abdomen and removing the tubes and ovaries of such women as will consent to that fashionable surgical procedure. In a word, it is this: inflammation tends to pass from the uterine cavity through the tubes to the pelvic peritoneum; in its course it destroys the proper structure of the oviducts, converts them into serous, bloody or purulent sacs, obstructs their channels and renders sterile the patient; while the disease thus lighted up in the pelvic peritoneum and ovaries causes excruciating pain, obscure nervous phenomena and general constitutional wreck, to say nothing of the adhesions that envelop the diseased ovaries, displace the womb and produce rectal and vesical distress. Here, say the would-be followers of Mr. Tait, is a morbid anatomical condition susceptible of relief in but one way, and that by abdominal section and excision of the ovaries and uterine appendages! And here let me make myself plain: for operations undertaken to relieve this morbid anatomical condition I have no words but words of commendation. The point I wish to make is, that recent teaching has led many to believe that the pathological sequence of inflammation of the genital passages, salpingitis, pelvic peritonitis and lesions of the internal parts, demanding abdominal section and excision of the ovaries and appendages, is the common every-day result of such disease in the female as is met with in ordinary practice. And again: I object to this sequence of pathological phenomena, not only because its misconception leads to an erroneous and injurious line of practice, but because it is not by any means *all* the truth, even in the cases where apparently it can be demonstrated. Thus, in patients with morbid anatomical evidences of pyosalpinx, pelvic peritonitis and ovaries buried in adhesions, it not infrequently happens that inflammation of the vagina and cervix was succeeded by abscess in the broad ligament, and this in its turn developed the changes in tubes and ovaries. But how different the result when proper surgical pro-

cedures are resorted to! Open and drain the abscess, the woman recovers, and, if she marries, may become a mother. Perform abdominal section, remove the ovaries and tubes, and everyone knows the generative function is forever destroyed. I do not contrast the relative dangers of drainage through the natural passages, and abdominal section, because personal experience has again and again convinced me that cases such as I have described, where pus collections in the pelvic cellular tissue succeeding and depending on primary inflammation of the utero-vaginal canal in turn produce disease of the pelvic peritoneum, tubes and ovaries of an exactly similar character to certain of those portrayed by the essayist, cannot be discriminated without an exploratory abdominal section. But the abdomen once opened and the disease located, the treatment is radically different. Vaginal drainage, after a thorough scraping out of the abscess sac, cures the patient with the minimum of danger, and without sacrificing any bodily organ. And the more I see of cases of pyosalpinx and pelvic peritonitis, the more firmly I am convinced that future years will witness a revolution in the treatment of these diseases; that abdominal section and excision of the tubes and ovaries will be reserved for a small minority of cases, and that vaginal drainage, after thorough scraping of the interior of the sac, will be found sufficient for the cure of the majority.

OBITUARY.

ELKANAH WILLIAMS, M.D.

BORN, DECEMBER 19, 1822. DIED, OCTOBER 5, 1888.

This distinguished physician needs no flattering commentary upon his life. Long since he erected his own imperishable monument. He was not only well known, but well loved both in and out of the profession.

The early life of Dr. Williams was spent in Indiana. His medical education was begun in Louisville, Kentucky, where he took his degree. After a few years of general practice he left this country to study in Europe. He gave special attention to ophthalmology and otology with the intention of practicing these branches exclusively upon his return to this country. Going to London from Germany soon after the invention of the ophthalmoscope, he had the honor of introducing that instrument to the English-speaking world. He settled and practiced his specialty in Cincinnati, a pioneer in ophthalmology. As a practitioner he was successful, as a teacher he was able, and as a writer he was instructive.

His character was lovely. "He was kind, truthful, sincere, honest, industrious, fearless, pure, humble and devout. He was lacking in no Christian grace." He was connected with the Christian church. His many acts of Christian charity are cherished by those to whom they have been lovingly done.

S.

JAMES D. DAUGHERTY, M.D.

James D. Daugherty, M.D., was born in Perry county Ohio, April 22, 1847. He graduated at the Ohio Medical College in 1872, and practiced medicine for one year in New Lexington, Ohio. From there he moved to Shawnee, Ohio, and after another year to Springfield, Ohio, where he remained two years, and then moved to Dayton, Ohio, where he practiced till the time of his last illness. He died of phthisis pulmonalis, July 12, 1888, at the home of his father.

JOSEPH TURNEY, M.D.

Dr. Joseph Turney was the grandson of John Turney and the seventh son of Joseph Turney, Sr., and was born in Mifflin township, Franklin county, Ohio, on the banks of Alum creek, on the twenty-second day of July, 1825, and died in Nevada, Ohio, July 1, 1888. Dr. Turney obtained the rudiments of an education in the school district of the village of Delaware, Ohio, finishing his education at the Woodstock Seminary. He began the study of medicine in Marion, Ohio, under the instruction of Dr. John Norton, in 1848, entering the Starling Medical College at Columbus, Ohio, in 1849, graduating February 22, 1851. He commenced the practice of his profession in Wyandot, Ohio, and, after several removals, located in Nevada, Ohio, in 1864, since which time he has been highly successful in his profession, and greatly esteemed by the medical fraternity whom he met. In 1862 Dr. Turney spent some time in the late war as surgeon in the field hospital, and in 1864 again was employed in the same capacity. He was married March 28, 1852, to Louesa Welsh, only daughter of Benjamin S. and Rebeca (Drake) Welsh, natives of Ohio and Virginia respectively.

In the death of Dr. J. Turney, every good citizen of Nevada and its entire vicinity feels the loss. He was a kind friend and father. Naturally of a kind and generous disposition, of great intelligence, honest and true in the strictest sense of the word, he was ever found doing all he could upon the side of right, and opposing wrong with a strength and courage which could not help but have due influence upon all with whom he came in contact. He leaves a wife and three children to mourn their most felt loss.

TULLY C. TURNEY.

LIST OF MEMBERS

OF THE

OHIO STATE MEDICAL SOCIETY,

WITH THEIR

POST-OFFICE ADDRESS AND DATE OF ADMISSION.

The names marked with an asterisk (*) have been members thirty years, and are exempt from payment of dues.

Adams, P. N	Dayton	1885
Alcorn, A. W	Ravenna	1870
Allen, D. B	West Liberty	1865
Allen, Dudley P	Cleveland	1885
Allen, Harlan P	Columbus	1884
Amidon, Rebecca S	Painesville	1886
Anderson, James	Salem	1884
Andre, O. C	Piketon	1888
Asbury, T. B	Jerome	1878
Ash, William N	Toledo	1887
Axline, C	Fultonham	1884
*Ayers, S. C	Cincinnati	1877
Bain, F. D	Kenton	1885
Baker, A. R	Cleveland	1886
Baker, George G	Akron	1884
Baker, W. O	Louisville	1882
Baldwin, J. F	Columbus	1875
Ballinger, J. B	Versailles	1880
Barnes, E. J	Hebron	1888
Barnes, W. T	Fredericksburg	1879
Barnhill, J. U	Columbus	1884

Barrere, D. M	New Carlisle	1884
Barton, T. J	Zanesville	1881
*Battles, W. S	Shreve	1858
Bauer, F. J	Mogadore	1886
Bauer, M. M	Lake	1884
*Beach, J. N	West Jefferson	1854
Beach, T. D	Catawba	1884
Beardsley, C. E	Ottawa	1869
Beck, J. S	Dayton	1879
Beers, A. M	Newcomerstown	1882
Belden, A. C	Akron	1878
Belt, W. A	Kenton	1887
Bennitt, J	Cleveland	1869
Bessey, J. Mortimer	Denver, Colorado	1887
Bishop, S. P	Delta	1870
Blair, James F	Linwood	1884
Blake, W. H	Shadeville	1878
Bleile, A. M	Columbus	1882
Bœrstler, G. W	Lancaster	1870
Bowen, A. H	London	1878
Boylan, A	Milford Centre	1878
Bramble, D. D	Cincinnati	1870
Brannan, T. H	Canal Dover	1884
Brashear, B. B	Cleveland	1886
Brayton, F. W	Carey	1881
Bricker, W. R	Shelby	1884
*Brinkerhoff, D. H	Fremont	1853
Brockett, A. J	Cleveland	1874
Brown, H. H	Lyons	1887
Brown, H. M	Hillsboro	1882
Brown, J. A	Germantown	1886
Brown, Warren Bateman	San Luis Obispo, Cal	1888
Brundage, A. H	Xenia	1878
Brush, E. C	Zanesville	1878
Buckingham, John M	Springfield	1885
Buckner, J. H	Cincinnati	1863
Buechner, W. L	Youngstown	1879

Buffett, Lewis	Easton, Maryland	1880
Bunce, Wm	Oberlin	1864
Bunn, J. W	West Union	1882
Butler, G. O	Cleveland	1870
Butler, G. W	Columbus	1869
Caldwell, Wm	Fremont	1886
Caldwell, W. W	Hamilton	1874
Campbell, W. A	Eaton	1888
Carmichael, W. A	Loveland	1871
Carpenter, A. B	Cleveland	1886
Carpenter, Julia W	Cincinnati	1879
Carr, E. C	Coshocton	1882
Carrick, A. L	Cincinnati	1871
Case, F. D	Ashtabula	1886
Chamberlin, D. P	Toledo	1874
Chaney, H. L	Columbus	1886
Chapman, Byron	Copley	1885
Chapman, W. C	Toledo	1875
Chase, James L	Toledo	1874
Christopher, W. S	Cincinnati	1888
Clark, C. F	Columbus	1885
Clark, John H	Mechanicsburg	1869
Clark, M. S	Youngstown	1876
Cline, J. W	Germantown	1886
Coldham, James	Toledo	1884
Coleman, N. R	Columbus	1875
Collamore, G. A	Toledo	1880
Colvill, G. H	Harrisville	1887
Conklin, W. J	Dayton	1868
Conn, Eli	Akron	1887
Conner, P. S	Cincinnati	1868
Cook, Alta F	Sandusky	1885
Cook, G. F	Oxford	1885
Cooper, A	Columbus	1881
Corlett, W. T	Cleveland	1882
Corson, O. M	Middletown	1879
Courtwright, A. P	Circleville	1871

Courtwright, G. S	Lithopolis	1867
Cowan, Chas. S	Hardin	1885
Cox, J. M	South Salem	1877
Craig, J. Harvey	Mansfield	1886
Craig, J. W	Mansfield	1874
Crane, A. M	Marion	1881
*Culbertson, Howard	Zanesville	1855
*Cushing, H. K	Cleveland	1857
Dandridge, N. P	Cincinnati	1871
Darby, F. H	Morrow	1882
Davies, W. C	Granville	1882
Davis, A. A	Abilene, Kansas	1884
Davis, B. W	Marion	1878
Davis, Wm. B	Cincinnati	1865
*Dawson, W. W	Cincinnati	1853
Deahofe, S. P	Potsdam	1888
Denman, W. C	Marion	1882
De Vilbis, Allen	Toledo	1887
Dickey, Thomas A	Middletown	1879
Dimmick, O. A	Chardon	1884
Dimond, Henry C	Springfield	1885
*Donahoe, H. J	Sandusky	1854
Donnellan, J. E	Germantown	1879
Dorman, W	Ashtabula Harbor	1886
Downs, S	Waterville	1876
*Drake, I. L	Lebanon	1859
Duff, J. S	Cadiz	1888
Duncan, A. M	Bucyrus	1886
Duncan, James A	Toledo	1874
*Dunlap, Alexander	Springfield	1854
Dunlap, C. O	McArthur	1881
Dunlap, C. W	Springfield	1869
Dutton, C. F	Cleveland	1880
Dwyer, R. A	New Petersburg	1879
Eckman, Hiram	Tuscarawas	1869
Eddy, C. W	Marietta	1888
Elster, L. A	Jeffersonville	1884

Emery, W. H.	Mt. Sterling	1881
Erwin, R. W.	Bay City, Mich.	1872
Evans, A. E.	Columbus	1882
Evans, R. P.	Franklin	1879
Everhard, N. S.	Wadsworth	1870
Everts, Orpheus	College Hill	1885
Fackler, J. E.	Versailles	1879
Ferguson, J. W.	Congress	1882
Ferrell, C. B.	Columbus	1878
Fisher, H. M.	Akron	1881
Fisher, P. Q.	Nashport	1873
Floyd, J. C. M.	Steubenville	1884
Follett, Alfred	Granville	1864
Foltz, Abner E.	Akron	1886
*Forbes, S. F.	Toledo	1856
Foster, G. F.	Kingston Center	1882
Fowler, S. W.	Delaware	1873
Frankenberg, O.	Columbus	1873
Franklin, G. S.	Chillicothe	1876
Fraunfelter, James	Canton	1886
*Fuller, S. W.	Bellefontaine	1853
Galbraith, E. J.	Chillicothe	1876
Gale, C. Bernard	Newport	1886
Gale, G. T.	Newport	1888
Galer, Frank M.	DeGraff	1874
Galloway, C. M.	Xenia	1888
Gawne, A. J.	Sandusky	1870
*Gay, N.	Columbus	1848
Gibson, Richard D.	Youngstown	1882
Gillespie, J. M.	Bloomingburg	1880
Gilliam, D. T.	Columbus	1873
Goodhue, George	Dayton	1884
Goodson, J. W.	Sterling, Kas	1874
Gordon, Joseph C.	Mt. Vernon	1886
*Gordon, T. W.	Georgetown	1849
Goss, J. H.	Lancaster	1884
Graefe, Wm.	Sandusky	1874

Graham, W. T	Lebanon	1888
Granger, B. D	Russell	1878
Granger, F. M	Russell	1881
Gray, F. C	Lewisburg	1879
Green, H. S	Cardington	1878
Greene, D. W	Dayton	1882
Grill, S. P	Orrville	1885
Groves, J. E	Uhrichsville	1884
Guerin, L. T	Columbus	1888
Guerin, Z. F	Columbus	1884
Guittard, A. M	Mt. Hope	1886
Guittard, F. J	New Bedford	1875
Gunsaulus, F	Columbus	1886
Haldeman, J. S	Zanesville	1885
Hall, C	Burlington	1872
Hall, R. B	Cincinnati	1884
Hall, W. W	Springfield	1882
Hamilton, H. A	Perrysburg	1886
*Hamilton, J. W	Columbus	1849
Hamilton, Wm. D	Columbus	1886
Hammel, M	Circleville	1878
Hardy, J. M	Whipple	1886
*Harmon, Julian	Warren	1857
Harrison, Eugene B	Napoleon	1869
*Hart, B. F	Marietta	1854
Hart, Samuel	Marietta	1887
Hartman, G. W	Archbold	1887
Hartman, S. D	Tippecanoe City	1874
Hathaway, H. H	East Toledo	1874
Haverfield, J. W	Uhrichsville	1886
Hedges, W. B	Delaware	1878
Heistand, E. B	Kenton	1884
Heiter, Carl	Sandusky	1875
Helmick, G. W	Harrisburg	1878
*Henderson, D. W	Marysville	1856
*Henderson, J. P	Neville	1850
Henderson, R	Urbana	1888

Hendrickson, Hugh	Columbus	1868
Herrick, H. J.	Cleveland	1868
Hiddleson, C. S	Atwater	1888
Hill, H	West Alexandria	1867
Hill, N. S	Neville	1866
Hillbish, F. S.	Fremont	1876
Himes, Isaac N	Cleveland	1877
Hinckley, H. D.	Oxford	1887
Hiner, S. B.	Lima	1874
Hines, J. A.	Van Wert	1879
Hipple, J. R.	Waldo	1881
Hixon, M. M	Dupont	1887
Hodges, G. H.	Urbana	1888
Hoff, J. W	Pomeroy	1872
Holliday, B. W.	Cleveland	1875
Hoover, C. M.	North Benton	1885
Hough, W. S	Cuyahoga Falls	1875
House, A. F	Cleveland	1880
*Howard, E. W.	Akron	1852
Hughes, M. A.	Port Clinton	1877
Humiston, W. H	Cleveland	1880
Hunter, T. S	Ashland	1878
Hurd, A	Findlay	1870
Hyatt, E. H	Delaware	1862
Iddings, A. H.	Dayton	1879
Ikirt, G. P	East Liverpool	1882
Ireland, W. E	Washington C. H	1887
Jacobs, W. C.	Akron	1881
Jennings, E.	Dayton	1867
Jewett, H. S	Dayton	1871
Jewett, W. H	West Canaan	1869
Johnson, Homer	Oberlin	1880
Johnson, O.	Worthington	1878
Jones, John D.	Cincinnati	1887
Jones, J. D.	Newburgh	1870
Jones, R. E.	Gomer	1863

Jones, T.	London	1878
*Jones, T. W.	Columbus	1847
*Jones, W. W.	Toledo	1848
Judkins, C. P.	Cincinnati	1887
Kahle, A. W.	Lima	1887
Kahle, R. D.	Lima	1887
*Kay, Isaac	Springfield	1853
Keller, Thomas F.	New Washington	1887
Kelly, H. R.	Galion	1868
Kelly, W. J.	Galion	1881
Kemper, A. C.	Cincinnati	1871
Kendig, E. V.	Hayesville	1874
King, C. W.	Dayton Insane Asylum	1881
King, John I.	Burgh Hill	1884
Kinkead, W. W.	Nashville, Tenn.	1884
Kinsman, D. N.	Columbus	1864
Kirkley, C. A.	Toledo	1874
Knowlton, A. P.	Berea	1870
Krause, B.	Cleveland	1880
Kreiger, G. L.	Lebanon	1884
Kurz, C. E.	Bellaire	1875
*Landon, C. P.	Westerville	1851
Larimore, F. C.	Mt. Vernon	1871
Lash, H. M.	Athens	1879
Lash, J. M.	Chillicothe	1879
Lathrop, A. B.	Swanton	1887
Lawless, J. T.	Toledo	1888
Lawrence, F. F.	Columbus	1888
Leach, S.	Mt. Sterling	1888
Lee, E. B.	Garrettsville	1870
Lee, M. F.	Columbus	1888
*Leonard, B. B.	West Liberty	1854
Leonard, B. S.	West Liberty	1882
Leslie, J. M.	Frankfort	1878
Lewis, W. C.	Rushville	1869
Lightner, S. B.	Sabina	1888
Little, D.	Logan	1882

*Lowing, S. ..... Columbus 1858
Lowman, J. H. ..... Cleveland 1877
*Lyman, C. N. ..... Wattsworth 1852
*Mack, John ..... Shelby 1853
Macneally, J. ..... Monroe 1865
Maris, Clarence ..... Columbus 1887
Markle, H. F. ..... Mifflin 1861
Martin, J. T. ..... Green Camp 1884
Matthews, R. C. ..... Columbus 1888
Mattoon, F. N. ..... Plain City 1881
McClellan, E. A. ..... Xenia 1888
McClung, Jno. C. ..... Leipsic 1897
McClure, James ..... Marietta 1866
McColum, E. J. ..... Tiffin 1871
McConnelly, J. C. ..... Vermilion 1875
McCurdy, John ..... Youngstown 1870
McCurdy, S. J. ..... Dennison 1882
McDowel, John C. ..... Delaware 1884
McEbright, T. ..... Akron 1866
McGavran, S. L. ..... Cadiz 1867
McGee, J. E. ..... Cleveland 1866
McGrew, Henry ..... Pleasant Ridge 1878
*McIlhenny, J. J. ..... Dayton 1840
McIntyre, W. ..... Warrensburg 1881
McKean, William ..... Dundee 1885
McKee, L. S. ..... Cincinnati 1886
McKim, I. L. ..... Marietta 1886
McKinley, E. E. ..... Vaughnsville 1887
McLean, J. T. ..... New Philadelphia 1884
McMillen, J. W. ..... Columbus 1878
McMurray, A. B. ..... Marion 1870
McNeely, J. S. ..... Hamilton 1885
Merriam, E. D. ..... Conneaut 1884
Merrill, A. E. ..... Vermilion 1876
Merriman, L. J. ..... Painesville 1884
Metzler, A. S. ..... Baltic .....
Miller, C. A. ..... Carthage .....

Mills, C. H.	Toledo	1888
Mills, J. T	Jersey	1878
Millikin, B. L.	Cleveland	1885
Millikin, Dan	Hamilton	1879
Moore, D. D	Xenia	1879
Moore, L. G	Kinsman	1878
*Morris, Jonathan	Ironton	1853
Morris, Joseph	Columbus Grove	1879
Mory, D. B	Wilmington	1884
Mory, J. J	St. Henry's	1871
Mosgrove, James M	Urbana	1884
Mounts, J. L	Morrow	1860
Murbach, A. J	Archbold	1874
Murphy, J. A	Cincinnati	1872
Murray, L. S	Medina	1870
Myers, I. A	Shelby	1881
Nash, E. K	Montrose	1886
Nau, J. G	Carroll	1878
Neil, Alexander	Columbus	1868
Nelson, H. W	Steubenville	1878
Norris, T. B	Alton	1882
Noyes, H. J	McConnelsville	1888
Nunemaker, H. B	Philadelphia In. Asy	1875
Ogan, Ambrose	Sedalia	1884
Ousley, J. B	Jacksonburg	1871
Overly, J. E	Columbus	1888
Palmer, C. D	Cincinnati	1871
Parker, Charles B	Cleveland	1886
Patterson, James W	Olena	1885
*Pearce, E	Steubenville	1859
Pearce, H. C	Urbana	1867
Pennell, W. W	Frederickstown	1884
Pettitt, R. R	Dayton	1885
Pickard, P	Mt. Vernon	1878
Pomerene, P. P	Berlin	1870
Pomeroy, F. S	Mountville	1884
Pomeroy, O	Chardon	1869

Pope, F. F. H.	Dalton	1885
Powell, W. S.	Defiance	1881
*Preston, J. C.	Cleveland	1857
*Price, Joseph	Randolph	1852
Priest, S. C.	Newark	1878
Quinn, A. T.	Wilmington	1881
Rankin, T. W.	Kirkersville	1881
Ranney, S. W.	Hope	1878
Ransohoff, Joseph	Cincinnati	1879
*Reamy, T. A.	Cincinnati	1855
Reed, C. A. L.	Cincinnati	1881
Reed, C. H.	Toledo	1873
Reed, R. C. S.	Stockton	1867
Reed, R. Harvey	Mansfield	1884
Reeve, J. C	Dayton	1861
Reinhart, J. C.	Toledo	1887
Rheinfrank, J. H	Perrysburg	1886
Rhu, Auguste	Marion	1886
Ricketts, B. M	Cincinnati	1884
Ricketts, E. S.	Cincinnati	1882
Ridenour, A. W.	Massillon	1886
Ridgway, N. B	Galion	1878
Riggs, J. M.	Bryan	1873
*Robison, J. D	Wooster	1856
*Rodgers, J. H.	Springfield	1859
Roebuck, D. Y	Dalton	1886
Rosenwasser, M.	Cleveland	1880
Row, G. T	Circleville	1881
Rowles, W. T.	Columbus	1888
Russell, E. S	Tuscarawas	1880
Russell, John E.	Mt. Vernon	1886
Ryan, George W	Cincinnati	1884
Sager, J	Celina	1882
Santee, Leon B.	Marlboro	1885
Sattler, Robert	Cincinnati	1872
Saxton, O. H.	Washington C. H.	1884
Scheibenzuber, A	Dayton	1885

Schnetzler, H. M	Toledo	1874
Schwan, F. W	Poplar	1880
Scott, A. C	Bladenburg	1884
Scott, B. B	Mt. Vernon	1884
Scott, Daniel A	Akron	1884
Scott, R. E	Bowerston	1887
Scott, W. A	Swanton	1878
*Scott, W. J	Cleveland	1855
Scott, Xenophon C	Cleveland	1874
*Scoville, S. S	Lebanon	1859
Seeley, W. W	Cincinnati	1871
Shaffner, Jno. F	Willshire	1887
Sharp, B. M	Sidney	1885
Sharp, H. J	London	1882
Sheldon, S. B	Five Mile	1882
Shepherd, W. W	Hillsborough	1871
Sherrard, A. C	Oakwood	1887
Shively, J. W	Kent	1886
Silver, D. R	Sidney	1870
*Sinnett, E	Granville	1850
Sisler, L. E	Clinton	1887
Skinner, S. W	Wagon Work	1881
Slocum, C. E	Defiance	1874
Smart, A. R	Toledo	1887
Smith, C. N	Toledo	1887
Smith, D. B	Cleveland	1870
Smith, J. M	New Philadelphia	1884
Smith, W. S	West Milton	1886
Smith, William G	Palmyra	1885
Snodgrass, J	Kenton	1878
*Snyder, D. J	Scio	1850
Snyder, S. P	New Bedford	1882
Souders, Samuel	Dean	1879
Southard, J. M	Marysville	1860
Southard, J. Q	Raymond	1882
Spence, J. A	Flushing	1888
Spencer, E. R	Doylestown	1885

Sperry, W	Tallmadge	1886
Spooner, H. K	Republic	1880
Stanley, E	Sandusky	1870
Stansell, J. A	Forest	1866
Starch, A. B	Milan	1880
Stark, W	Cincinnati	1871
Stein, G. S	Columbus	1888
Stephens, Alfred H	Eaton	1884
*Stevens, E. B	Lebanon	1853
Stevens, Edward S	Cincinnati	1886
Stevens, M. B	Defiance	1887
Stewart, T. H	Church Hill	1877
Stewart, W. D	Pemberville	1887
*Stillwell, Thomas	Fremont	1857
Stockstill, J. N	New Carlisle	1867
Storey, William	Castalia	1884
Strain, A. J	London	1881
*Sweney, R. L	Marion	1859
Szendery, L	Sandusky	1887
Tangeman, C. W	Cincinnati	1888
Taylor, H. Longstreet	Cincinnati	1888
Taylor, W. H	Cincinnati	1874
Telfair, Geo. M	Bloomington	1884
Teters, B. F	Berlin	1886
Thomas, F. W	Marion	1884
Thorn, E. I	Yellow Springs	1878
Thorn, S. S	Toledo	1873
Thrasher, A. B	Cincinnati	1876
Tichenor, E. J	Lebanon	1869
Titus, A	Portsmouth	1888
Tobey, H. A	Toledo	1878
Torrence, J. M	Jamestown	1888
Tracy, J. L	Toledo	1884
Trimble, R. T	New Vienna	1881
Underwood, W. J	Akron	1869
Upson, H. S	Cleveland	1888
Vail, J. B	Lima	1885

Vance, R. A	Cleveland	1881
Vandervort, J. W	Harveysburg	1864
*Vannata, E	Fultonham	1855
Van Pelt, C. L	Toledo	1887
Van Winkle, N. B	Blanchester	1885
Vigor, F. A	New Dover	1884
Wagenhals, F	Columbus	1885
Waggoner, Joseph	Ravenna	1870
Walker, A. B	Canton	1882
Wallace, John	Rushsylvania	1879
Ward, C. S	Warren	1875
Ward, W. A	Conneaut	1880
Warner, A. D	Fullertown	1880
Warner, Frank	Columbus	1884
Weaver, J. M	Dayton	1865
Webster, E. W	Kingsville	1876
Weed, F. J	Cleveland	1870
Weed, T. A	Cleveland	1880
Weeks, O. W	Marion	1884
Wellons, G. S	Barnesville	1878
Welty, O. S	Canal Dover	1886
West, T. J	Tiffin	1875
White, G. M	Columbus	1888
White, Horace W	Delaware	1887
Whittaker, J. T	Cincinnati	1871
Wilkins, John A	Delta	1874
*Williams, A. S	Fostoria	1852
Williams, J. L	Cardington	1878
Williams, T. B	Cleveland	1864
Williard, G. P	Tiffin	1875
Willson, W. H	Greenfield	1865
Wilson, D. C	Ironton	1872
Wilson, E. J	Columbus	1884
Wilson, J. L	Greenfield	1871
Winslow, J. W	Spring Mountain	1881
Wire, G. W	Wilmington	1885
Wirth, R	Columbus	1886

Wise, D. B.	Mt. Eaton	1881
Wood, J. S.	Collinwood	1880
Woodbridge, John E.	Youngstown	1880
Woodruff, L.	Akron	1867
*Woods, D. B.	Warren	1852
Woods, J. T.	Toledo	1862
Woodward, W. R.	Cincinnati	1871
Wright, John A.	Toledo	1885
Wright, John W.	Columbus	1883
Wright, S. St. J.	Tallmadge	1880
Wylie, A. N.	Ripley	1860
Wylie, J. L.	Ripley	1872
Yost, W. N.	Mt. Blanchard	1879
Zeigler, H. H.	Aversville	1884
Zenner, Philip	Cincinnati	1882

NON-RESIDENT PERMANENT MEMBERS.

Koogler, M. A.....Eldorado, Kansas.....1884
Ludington, H.....Omaha, Neb.....1871
Martin, G.....Adrian, Mich.....1877

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Professor Isidor Neumann, Vienna, Austria.
Professor Herman Wiederhofer, Vienna, Austria.
Professor Carl Sigmund,* Vienna, Austria.
Professor Herman Zeissl,* Vienna, Austria.
Professor Ed. C. Seaton,* Medical Inspector of the Privy Council, London, England.
Professor M. Jules Guerin,* Member Imperial Academy of Medicine, Paris, France.

HONORARY MEMBERS.

*Awl, W. M.	Columbus	1872
*Bailey, M. J.	New York City	1852
*Baron, P.	Ravenna	1870
Bartholow, Roberts	Philadelphia, Pa	1879
Beeman, P.	Sidney	1872
Blackburn, J. C	Covington, Ky	1857
*Boerstler, G. W	Lancaster	1865
Brodie, William	Detroit, Mich	1875
*Brower, J. H	Lawrenceburg, Ind	1854
*Childs, H. H	Pittsfield, Mass	1848
*Conant, H	Maumee City	1874
*Dalton, N	Mineral Point, Wis	1871
Gundry, Richard	Catonsville, Md	1879
*Guthrie, C. B	New York City	1849
Harding, M. H	Lawrenceburg, Ind	1854
Haughton, R. E	Richmond, Ind	1863
*Hayes, I. I	Philadelphia, Pa	1857
*Hempstead, G. S. B	Portsmouth	1872
Hibberd, James F	Richmond, Ind	1871
Hill, E. L	Oxford	1856
*Hunt, S. P	Richmond, Indiana	1866
Jenks, E. W	Detroit, Michigan	1875
Kerr, John	Canton, China	1875
*Kirtland, Jared P	Cleveland	1874
Kitchen, J. M	Indianapolis, Indiana	1866
*Knight, J	New Haven, Conn	1849
*Lee, Charles A	New York City	1848
Lyons, W. B	Huntington, Indiana	1866
*McIlvaine, R. R	New York City	1871
*Moe, L. W	Ottawa	1876

* Deceased.

*Mussey, R. D	Cincinnati	1865
Noyes, J. F	Detroit, Michigan	1875
*Parker, Willard	New York City	1852
Safford, E. D	Parkersburg, W. Va	1870
Steele, H. K	Denver, Colorado	1872
Stevenson, J. M	Pittsburgh, Pa	1866
*Sutton, George	Aurora, Indiana	1854
Sutton, R. S	Pittsburgh, Pa	1884
*Thompson, Robert	Columbus	1865
*Trevitt, William	Columbus	1858
*Tully, William	New Haven, Conn	1849
Vaughn, Victor C	Ann Arbor, Mich	1889

* Deceased.

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